
SELECTION
GUIDE
2024
PRODUCTS
SOLUTIONS
SERVICES
POCLAIN

# POCLAIN

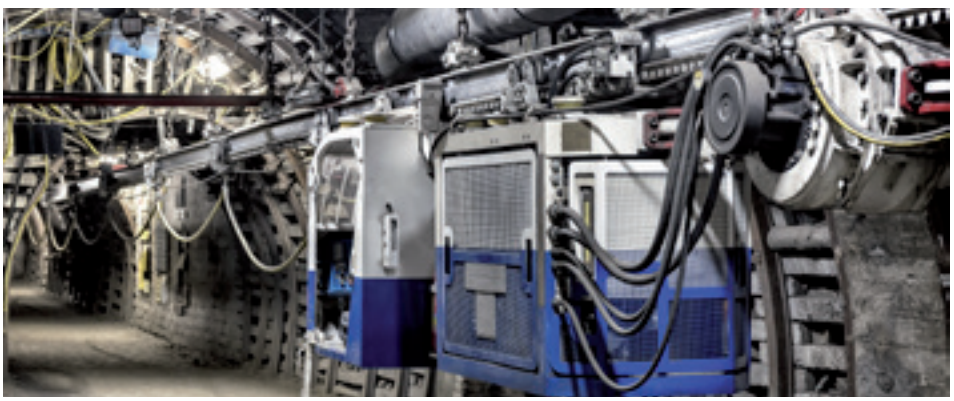
## SOLUTIONS FOR THE MOST DEMANDING MARKETS

Poclain specializes in the design, manufacturing and marketing of high torque travel drive and tool drive transmissions.

Our internationally recognized expertise allows us to expand on highly diversified markets such as the construction, agricultural, public works, material handling, industrial, environment and on-road markets. Poclain's development is driven by our innovative spirit and our ability to anticipate the needs of a wide range of cutting edge applications.

- > Construction
- > Agricultural
- > Mining
- > Forestry
- > Environment
- > Material handling
- > Industry
- > Marine
- > On-Road
- > Etc

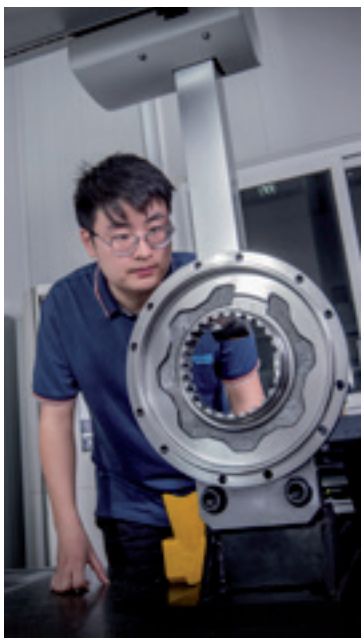

ALPHA evo



# *A CLOSE PROXIMITY PLAYER*
## THROUGH OUR WORLDWIDE PLANT LOCATIONS

Poclain hydraulics is an industrial company concerned about sustainable development issues. For this reason the Group has decided to develop a responsible growh based on respect of the environment in each production site (ISO 14001 and ISO 50001) and to commercialize recyclable and low carbon solutions.

**> 5 Plants in Europe**
**> 2 Plants in Asia**
**> 1 Plant in America**



## CZECH REPUBLIC (Motors)

POCLAIN HYDRAULICS S.R.O
Kšírová186
619 00 Brno
Tel.: +420 543 563 121

## CHINA (Motors, Pumps, Valves)

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Factory Building n° 11,
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Shanghai 201611
Tel.: +86 21 37 00 34 15

## FRANCE (Motors)

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OPERATIONS VERBERIE
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Tel.: +33 3 44 40 77 77

## FRANCE (Pistons)

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146, avenue du Môle
74460 Marnaz
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## ITALY (Pumps)

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INDUSTRIALE SRL
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41013 Castelfranco Emilia (MO)
Tel.: +39 059 959711

## INDIA (Motors)

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No: 131 / 2, Kothapurinatham Road
Mannadipet Commune Panchayat
Thiruvandarkoil
Pondicherry - 605 102
Tel.: +91 4132641444 / 2641477

## SLOVENIA (Valves)

POCLAIN HYDRAULICS D.O.O
Industrijska ulica 2
Žiri 4226
Tel.: +386 (0)4 51 59 100

## USA (Motors, pumps)

POCLAIN HYDRAULICS INC
1300 N Grandview Parkway
P.O. Box 801
Sturtevant, WI 53177
Tel.: +1 262 321 0676

# POCLAIN HYDRAULICS
## CONFORMS TO REACH REGULATION

Declaration on European Union (EC) Directive 1907/2006 of the European council of December 18th, 2006 concerning Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) published on 30 December 2006.
Communication as per REACH Article 33.1 requirements

Dear Customer,

Poclain Hydraulics conforms to REACH Regulation.

Poclain Hydraulics does not import or manufacture substances listed on the Candidate list which are present in its article in EU. By this, Poclain Hydraulics is not concerned by Article 7.2 of REACH Regulation.

Link to latest updated candidate list : https://echa.europa.eu/candidate-list-table

Poclain Hydraulics products do not contain any substance listed in the Substances of Very High Concern table (SVHC) at a level higher than 0,1 % per weight at sold product level. However, some of its products listed here below contain sub-assembly parts with substances at a higher rate than 0,1% per weight :

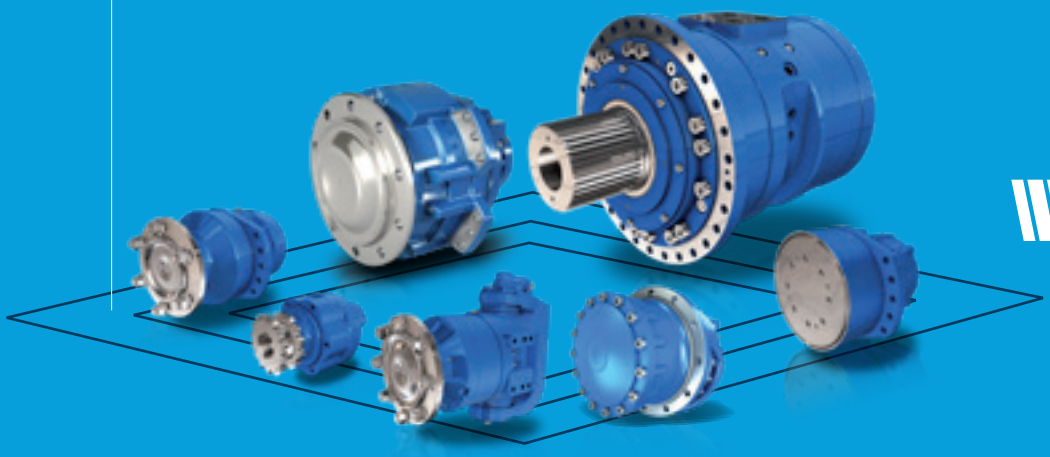
| Substance | Sold Products |
|---|---|
| Lead<br>(CAS No. 7439-92-1) | Cam lob motors which commercial code starts with MG or does not end with a last group of characters having the letter Z can contain lead, except MHP motors.<br><br>e.g. MZE02-2-BCF-F10-5AP5-3FHX<br>e.g. MGE11-1-R18-101-1920-EJS0<br><br>The rules defined above cover most of our range of products. Traceability is ensured and Poclain Hydraulics can, upon request, give the information for a given motor part number. |
| | - All MORV & M high speed motors<br>- All PM Pumps |
| | Valve whom housings and blocks are made of steel or aluminium. By end 2021, Poclain Hydraulics will have replaced in these valves lead by alternative REACH compliant material. |

The standard use of these products is approved and safe. The use of the substance does not require specific Safety documentation. At the end of its life, the product should be processed according to the relevant procedures.
Poclain Hydraulics draws attention of its suppliers and subcontractors to their obligations in connection with REACH.

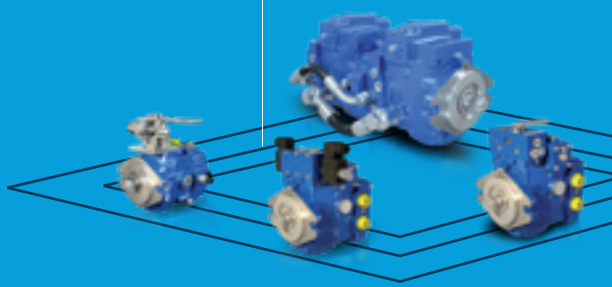
This declaration is issued based on our current level of knowledge, and covers all products.

**Harry CALLEBAUT**
Group HSE Director

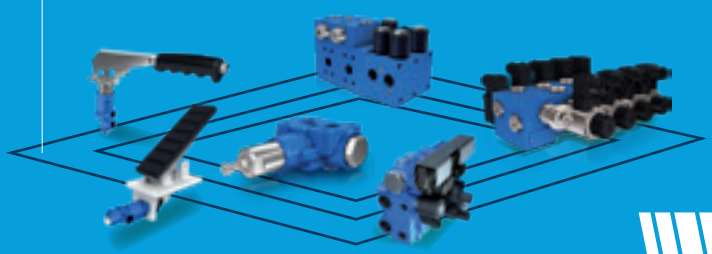
**Olivier DION**
Group Design and Advanced Manufacturing Engineering Director













## READY-TO-USE SOLUTIONS 124



## POCLAIN SERVICES 149

# MOTORS

# HYDRAULIC MOTORS
## HIGH TORQUE AND RADIAL PISTONS

### HIGH PERFORMANCE

| | |
|---|---|
| Displacement range | 933 to 3 526 cm³/rev. [56.9 to 215.2 cu.in/rev.] |
| Max. Speed | 548 rpm |
| Max. Power | 280 kW [375 HP] |

MHP

p.14

### MODULARITY AND VERSATILITY

| | |
|---|---|
| Displacement range | 172 to 15 000 cm³/rev. [10.5 to 915 cu.in/rev.] |
| Max. Speed | 700 rpm |
| Max. Power | 240 kW [322 HP] |

MS

p.24

### COMPACT

MK

| | |
|---|---|
| Displacement range | 272 to 2 812 cm³/rev. [16.6 to 171.5 cu.in/rev.] |
| Max. Speed | 160 rpm |
| Max. Power | 70 kW [94 HP] |

p.36

### STEERABLE WHEEL MOTORS

MG

| | |
|---|---|
| Displacement range | 172 to 2 519 cm³/rev. [10.5 to 153 cu.in/rev.] |
| Max. Speed | 510 rpm |
| Max. Power | 80 kW [107 HP] |

p.42

## SWING DRIVE

**MZ**

| | |
|---|---|
| Displacement range | 213 to 750 cm³/rev. [13.0 to 45.7 cu.in/rev.] |
| Max. Speed | 470 rpm |
| Max. Power | 29 kW [39 HP] |

p.48

## SKID-STEER DRIVE

**ML**

| | |
|---|---|
| Displacement range | 174 to 842 cm³/rev. [10.6 to 51.4 cu.in/rev.] |
| Max. Speed | 483 rpm |
| Max. Power | 30 kW [40 HP] |

p.52

## TRACK DRIVE

**MT**

| | |
|---|---|
| Displacement range | 495 to 920 cm³/rev. [30.2 to 56.1 cu.in/rev.] |
| Max. Speed | 270 rpm |
| Max. Power | 41 kW [55 HP] |

p.56

## INDUSTRIAL

**MI**

| | |
|---|---|
| Displacement range | 7 000 to 40 000 cm³/rev. [426.9 to 2,441 cu.in/rev.] |
| Max. Speed | 140 rpm |
| Max. Power | 600 kW [804 HP] |

p.60

## HYDROBASE FOR WHEEL HUBS

**MF**

| | |
|---|---|
| Displacement range | 627 to 1 248 cm³/rev. [38.2 to 76.1 cu.in/rev.] |
| Max. Speed | 150 rpm |
| Max. Power | 41 kW [55 HP] |

p.66

## CREEP DRIVE

**CDM**

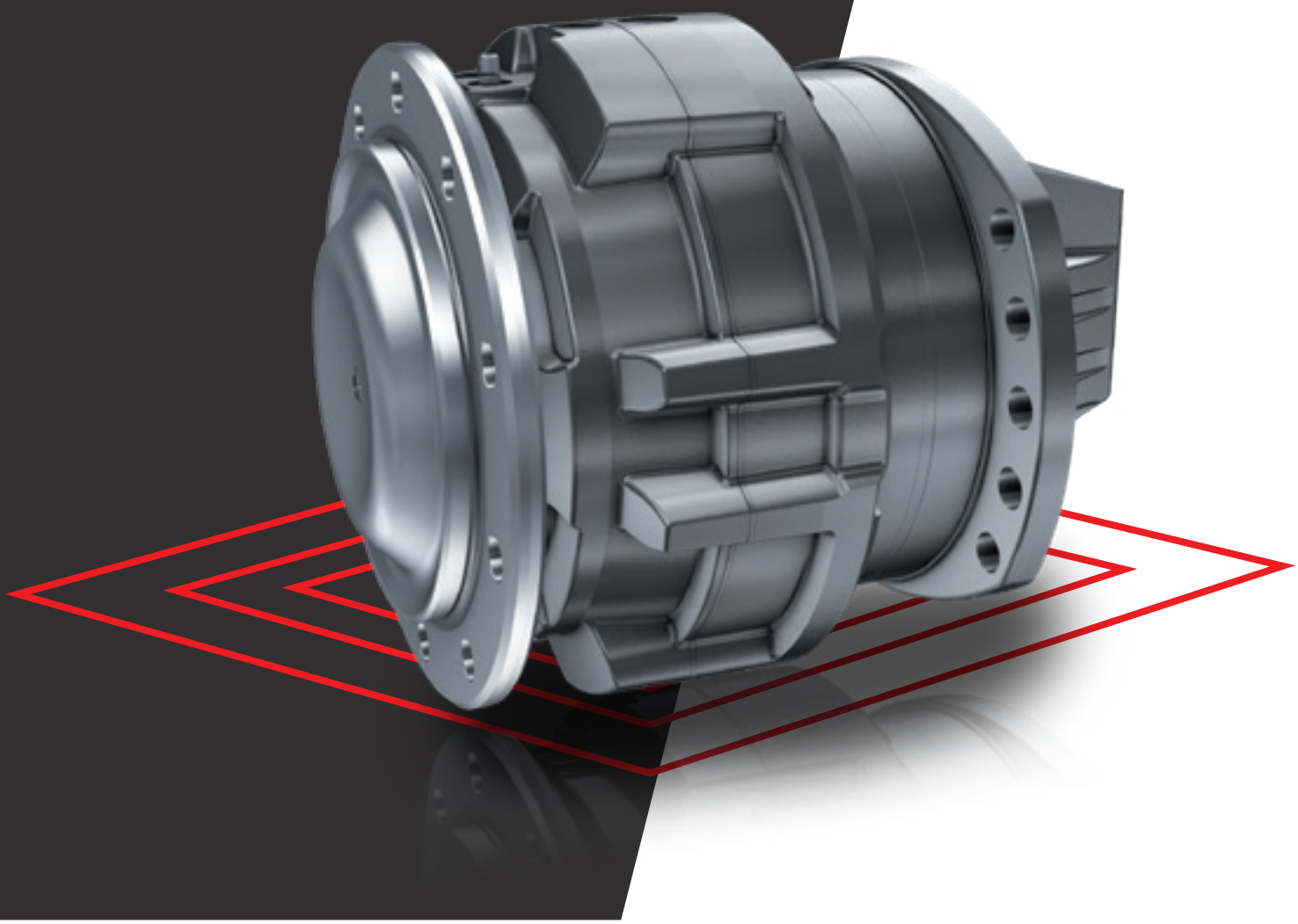
| | |
|---|---|
| Displacement range | 667 to 2 424 cm³/rev. [40.7 to 148.1 cu.in/rev.] |
| Max. Speed | 315 rpm |
| Max. Power | 40 kW [54 HP] |

p.70

# HIGH PERFORMANCE MOTORS

## High Performance

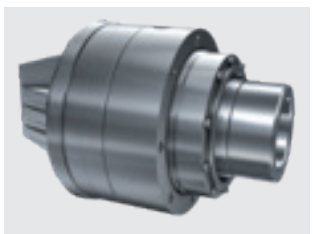
- Higher speed and power
- High efficiency
- One, dual, three or four displacements
- With or without brake
- Compactness



# MHP

## MHP11 ▪ MHP13 ▪ MHP17
## MHP20 ▪ MHP27

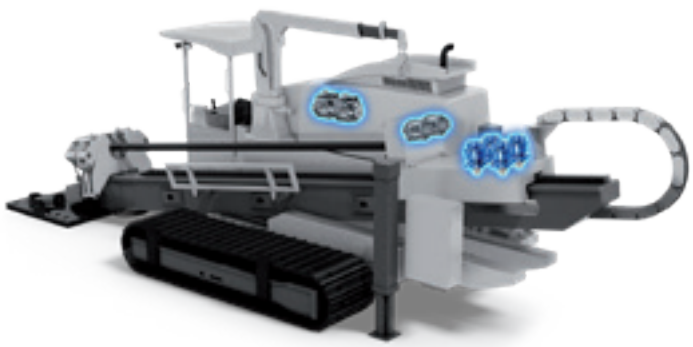
| |
|---|
| From 933 to 3 526 $cm^3$/rev. [56.9 to 215.2 cu.in/rev.] |
| Up to 28 059 N.m [20,695 lbf.ft] |
| Up to 500 bar [7,252 PSI] |
| Up to 548 rpm |
| Up to 280 kW [375 HP] |



## Performance

| | | Max. Pressure bar [PSI] | Max.Speed RPM | Displacement range cm³/rev [cu.in/rev] | Max. Torque* N.m [lbf.ft] | Max. Power** kW [HP] |
|---|---|---|---|---|---|---|
| **Single displacement motors** | **MHP11** | 450 [6,527] | 324 | 933 - 1 401 [56.9] - [85.5] | 10 000 [7,376] | 104 [139] |
| | **MHP13** | 500 [7,252] | 520 | 900 - 1 542 [54.9] - [94.1] | 12 258 [9,041] | 151 [202] |
| | **MHP17** | 500 [7,252] | 379 | 1 200 - 2 238 [73.2] - [136.6] | 17 792 [13,123] | 249 [334] |
| | **MHP20** | 500 [7,252] | 505 | 1 416 - 2 427 [86.4] - [148.1] | 19 313 [14,244] | 200 [268] |
| | **MHP27** | 500 [7,252] | 340 | 1 893 - 3 526 [115.5] - [215.2] | 28 059 [20,695] | 280 [375] |
| **Dual displacements motors*** ** | **MHP11** | 450 [6,527] | 318 | 311 - 1 401 [19.0] - [85.5] | 10 000 [7,376] | 106 [142] |
| | **MHP13** | 500 [7,252] | 548 | 300 - 1 542 [18.3] - [136.6] | 12 258 [9,041] | 158 [212] |
| | **MHP17** | 500 [7,252] | 398 | 400 - 2 238 [24.4] - [85.4] | 17 792 [13,123] | 241 [323] |
| | **MHP20** | 500 [7,252] | 520 | 531 - 2 427 [32.4] - [148.1] | 19 313 [14,244] | 190 [255] |
| | **MHP27** | 500 [7,252] | 345 | 710 - 3 526 [32.4] - [215.2] | 28 059 [20,695] | 230 [308] |
| **Three displacements motors** | **MHP11** | 450 [6,527] | 293 | 311 - 1 401 [19.0] - [85.5] | 10 000 [7,376] | 105 [141] |
| | **MHP13** | 500 [7,252] | 491 | 300 - 1 542 [18.3] - [136.6] | 12 258 [9,041] | 154 [206] |
| | **MHP17** | 500 [7,252] | 360 | 400 - 2 238 [24.4] - [85.4] | 17 792 [13,123] | 250 [335] |
| | **MHP20** | 500 [7,252] | 480 | 354 - 2 427 [21.6] - [148.1] | 19 313 [14,244] | 175 [235] |
| | **MHP27** | 500 [7,252] | 330 | 473 - 3 526 [28.9] - [215.2] | 28 059 [20,695] | 215 [288] |
| **Four displacements motors** | **MHP20** | 500 [7,252] | 435 | 354 - 2 427 [21.6] - [148.1] | 19 313 [14,244] | 175 [235] |
| | **MHP27** | 450 [6,527] | 316 | 473 - 3 526 [28.9] - [215.2] | 28 059 [20,695] | 215 [288] |

*Max. theoretical torque (N.m) : 1/(20 $\pi$) x max. displacement (cm³/rev.) x max. pressure (bar)
**Max. power obtained at max. speed
*** Symetrical valving available in configuration without boosted brake



## Bearing support types

| | Wheel flange | Wheel flange service brake | Wheel flange parking brake | Wheel flange combined brake | Male splined shaft | Male splined shaft parking brake | Female splined shaft | Shaft for shrink disc |
|---|---|---|---|---|---|---|---|---|
| | | | | | NF-E22-141 DIN 5480 | NF-E22-141 DIN 5480 | DIN 5480 | |
| MHP11 | ● | ● | ● | | ● | | | |
| MHP13 | ● | ● | ● | | ● | ● | | |
| MHP17 | ● | ● | ● | | ● | ● | | |
| MHP20 | ● | ● | ● | ● | ● | ● | ● | ● |
| MHP27 | ● | ● | ● | ● | ● | ● | ● | ● |

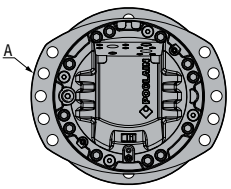
## Chassis fixation types

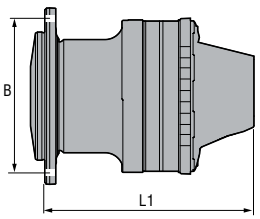
| | On the valving cover Two lugs | On the bearing support Four lugs | On the bearing support Two lugs | On the bearing support |
|---|---|---|---|---|
| MHP11 | ● | | ● | |
| MHP13 | ● | | ● | |
| MHP17 | ● | | ● | |
| MHP20 | ● | ● | ● | ● |
| MHP27 | ● | ● | ● | ● |

## Dimensions

Thanks to its compactness and modularity, the integration of the MHP motor on customers machine is more easily facilitated, which helps to cut design and assembly cost for the OEMs, while allowing them to offer versatile and customized solutions to their end-customers.

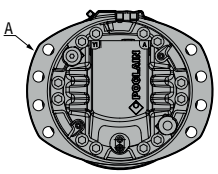
### Wheel flange motor

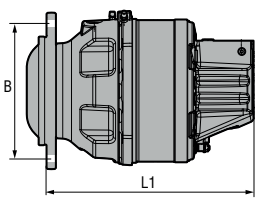



| | | MHP11 | MHP13 MHP17 | MHP20 MHP27 |
|---|---|---|---|---|
| **L1 max.** | mm [in] | 360,4 [14.19] | 387,4 [15.25] | 458,1 [18.03] |
| **dia. A max.** | mm [in] | 377 [14.84] | 377 [14.84] | 425 [16.73] |
| **dia. B max.** | mm [in] | 275 [10.83] | 275 [10.83] | 275 [10.83] |
| **Weight max.** | kg [lb] | - [-] | - [-] | 170 [375] |

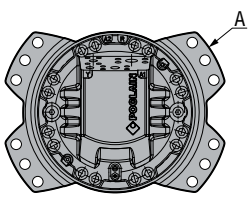
### Wheel flange motor with P17-P20 parking brake or S17-S20 service brake

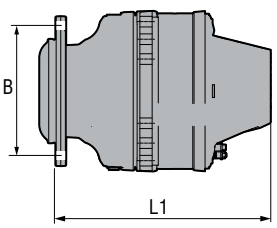



| | | MHP11 (P17 - S17) | MHP13 MHP17 (P17 - S17) | MHP20 MHP27 (P20-S20) |
|---|---|---|---|---|
| **L1 max.** | mm [in] | 392,3 [15.44] | 420,4 [16.55] | 430,7 [16.96] |
| **dia. A max.** | mm [in] | 377 [14.84] | 377 [14.84] | 425 [16.73] |
| **dia. B max.** | mm [in] | 275 [10.83] | 275 [10.83] | 335 [13.19] |
| **Weight max.** | kg [lb] | - [-] | - [-] | - [-] |

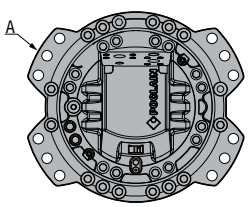
### Wheel flange motor with P27 parking brake

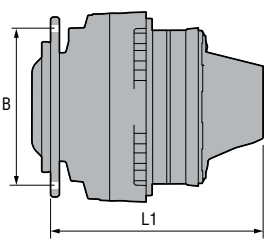



| | | MHP20 MHP27 |
|---|---|---|
| **L1 max.** | mm [in] | 456,1 [17.96] |
| **dia. A max.** | mm [in] | 483 [19.01] |
| **dia. B max.** | mm [in] | 335 [13.19] |
| **Weight max.** | kg [lb] | 231 [509] |

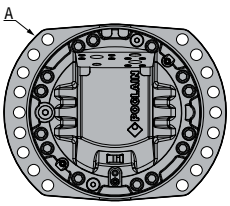
### Wheel flange motor with C27 combined brake

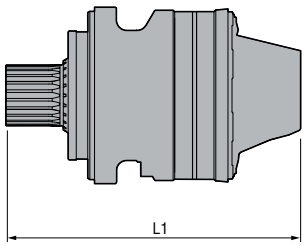



| | | MHP20 MHP27 |
|---|---|---|
| **L1 max.** | mm [in] | 456,1 [17.96] |
| **dia. A max.** | mm [in] | 482 [18.98] |
| **dia. B max.** | mm [in] | 335 [13.19] |
| **Weight max.** | kg [lb] | 240 [529] |

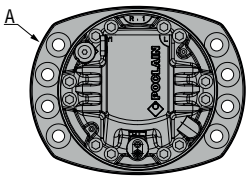
## Male splined shaft motor

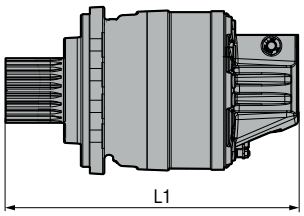



| | | MHP11 | MHP13 MHP17 | MHP20 MHP27 |
|---|---|---|---|---|
| **L1 max.** | mm [in] | 415 [16.33] | 444 [17.48] | 568 [22.36] |
| **dia. A max.** | mm [in] | 375 [14.76] | 375 [14.76] | 425 [16.73] |
| **Weight max.** | kg [lb] | - [-] | - [-] | 136 [299] |

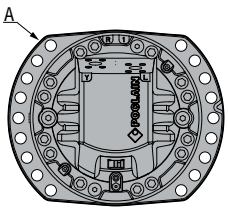
## Male splined shaft motor with P17-P20 parking brake

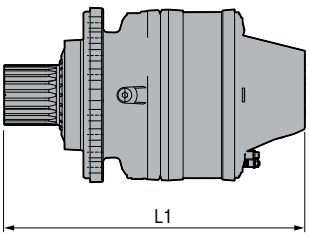



| | | MHP13 MHP17 (P17) |
|---|---|---|
| **L1 max.** | mm [in] | 541 [21.30] |
| **dia. A max.** | mm [in] | 393 [15.47] |
| **Weight max.** | kg [lb] | - [-] |

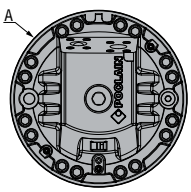
## Male splined shaft motor with P27 parking brake

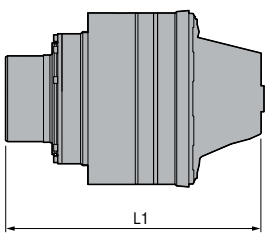



| | | MHP20 MHP27 |
|---|---|---|
| **L1 max.** | mm [in] | 599 [23.58] |
| **dia. A max.** | mm [in] | 425 [16.73] |
| **Weight max.** | kg [lb] | 230 [507] |

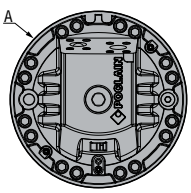
## Female splined shaft motor

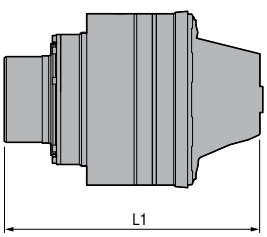



| | | MHP20 MHP27 |
|---|---|---|
| **L1 max.** | mm [in] | 502 [19.76] |
| **dia. A max.** | mm [in] | 340 [13.38] |
| **Weight max.** | kg [lb] | 157 [346] |

## Shrink disc motor




| | | MHP20 MHP27 |
|---|---|---|
| **L1 max.** | mm [in] | 495 [19.49] |
| **dia. A max.** | mm [in] | 340 [13.38] |
| **Weight max.** | kg [lb] | 157 [346] |

## Brakes

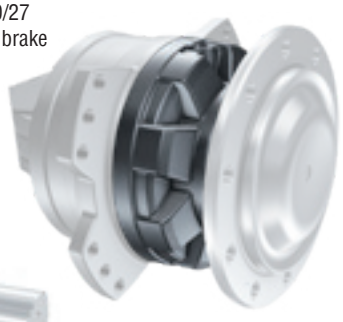
### Multidisc parking brake mounted in the bearing support

- Parking brake release pressure: 16 to 30 bar [232 to 435 PSI]
- Negative brake

**Mini. parking braking torque**

| | N.m [lb.ft] | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|---|
| **P17** | 16 000 [11,801] | ● | ● | ● | | |
| **P20** | 21 700 [16,005] | | | | ● | ● |
| **P27** | 29 200 [21,537] | | | | ● | ● |

MHP20/27
with P27 brake



MHP13/17
with P17 brake

### Multidisc service brake mounted in the bearing support

- Pressure to obtain max. service braking torque: 120 bar [1,740 PSI]
- Positive brake

**Average service braking torque**

| | N.m [lb.ft] | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|---|
| **S17** | 21 300 [15,710] | ● | ● | ● | | |
| **S20** | 25 000 [18,439] | | | | ● | ● |

MHP13/17
with S17 brake

### Multidisc combined brake mounted in the bearing support or in the cover

The C27 combined brake available on MHP 20 and MHP 27 motors, combines service and parking brake ability and offers powerful and reliable braking performance thanks to its closed design (wet discs technology) not sensitive to external pollution.

- Parking brake release pressure: 100 to 130 bar [1,450 to 1,885 PSI]
- Negative brake

- Pressure to obtain max. service braking torque: 70 bar [1,015 PSI]
- Positive brake

**Mini. parking and average braking torque**

| | Parking | Service | | |
|---|---|---|---|---|
| | N.m [lb.ft] | N.m [lb.ft] | MHP20 | MHP27 |
| **C27** | 18 000 [13,276] | 32 000 [23,602] | ● | ● |

MHP20/27
with C27 brake

# TWIN-LOCK™ : FULLY HYDROSTATIC ANTI-SKID SOLUTION

## Increase the off-road capability of your machines

Wheel adherence is a critical factor with off road vehicles. Lose adequate wheel contact with the ground and you can lose control of your machine, put it temporarily out of service, cause premature tire wear, dramatically increase fuel consumption or churn up the site. Poclain Hydraulics, a specialist in hydrostatic transmission, has designed and developed Twin-Lock™ to increase the performance of its hydrostatic drive systems on difficult ground conditions and steep gradients.

**Motor sizes**

- MHP11
- MHP13
- MHP17
- MHP20
- MHP27

**TWIN-LOCK™**

More information > 126

# BOOSTED BRAKE

## More security for self-propelled machines

Improve the braking performance of self-propelled machines by using the entirely hydrostatic braking capacity of hydraulic motors. The technology - Boosted Brake - meets the braking requirements for machines running at 40 kph [24.8 mph].

On a self-propelled machine running at 40kph [24.8 mph] the hydrostatic brake must be combined with a friction brake to meet European regulations of deceleration.
Poclain Hydraulics has developed a technology - Boosted Brake - to increase the hydrostatic braking capacity of self-propelled machines.

**Motor sizes**

- MHP11
- MHP13
- MHP17
- MHP20
- MHP27
- MS-MSE18
- MS35

More information > Page 134

## Built-in features

### Temperature control

| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| High efficiency (zero clearance pistons/ring) | ● | ● | ● | ● | ● |
| Additional case flushing port | ● | ● | ● | ● | ● |

### Speed

| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| High speed / Low pressure drop (Butterfly valving) | ● | ● | ● | ● | ● |
| Predisposal for speed sensor | ● | ● | ● | ● | ● |

### Reinforcement

| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| PEEK bushing (against high temperature) | | ● | ● | ● | ● |
| Monobloc cover | ● | ● | ● | ● | ● |

### High pressure connection

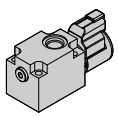
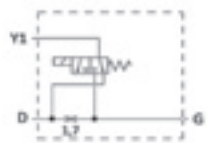
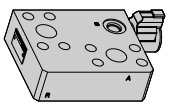
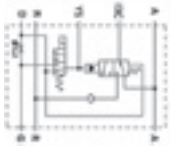
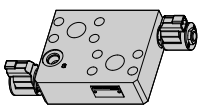
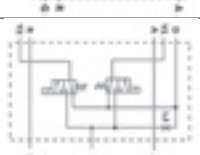
| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| Flat ports for valve | ● | ● | ● | ● | ● |

MHP20/27
with flat ports

## Flanged valves

Designed with a flat porting surface, the MHP 20 and MHP 27 motors can receive valve blocks, which can be flanged on the cover in order to enhance the control (electrical command for displacement shifting) and simplify the piping on the machine.

MHP20/27
with three displacements
piloting valve

| | Piloting | Max. operating pressure | Max.flow | Hydraulic schematics |
|---|---|---|---|---|
| | | bar [PSI] | L/min [GPM] | |
|  | 2nd displacement | 500 [7,252] | 30 [7.92] |  |
|  | 2nd displacement + Boosted brake | 150 [2,175] | 15 [3.96] |  |
|  | Three displacements | 500 [7,252] | 30 [7.92] |  |

## Optional features

### Temperature control

| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| Exchange valve | ● | ● | ● | ● | ● |

### Speed

| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| Speed sensor | ● | ● | ● | ● | ● |

### Reinforcement

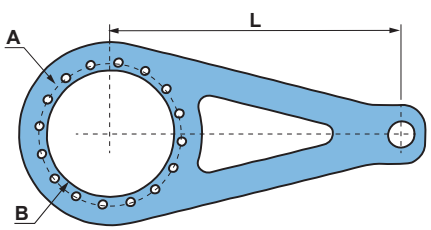
| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| Extra long life (Diamond™) | ● | ● | ● | ● | ● |

### High pressure connection

| | MHP11 | MHP13 | MHP17 | MHP20 | MHP27 |
|---|---|---|---|---|---|
| SAE Flange | ● | ● | ● | ● | ● |
| Metric | ● | ● | ● | ● | ● |
| UNF | ● | ● | ● | ● | ● |
| GAS | ● | ● | ● | ● | ● |

## Torque arms and shrink discs

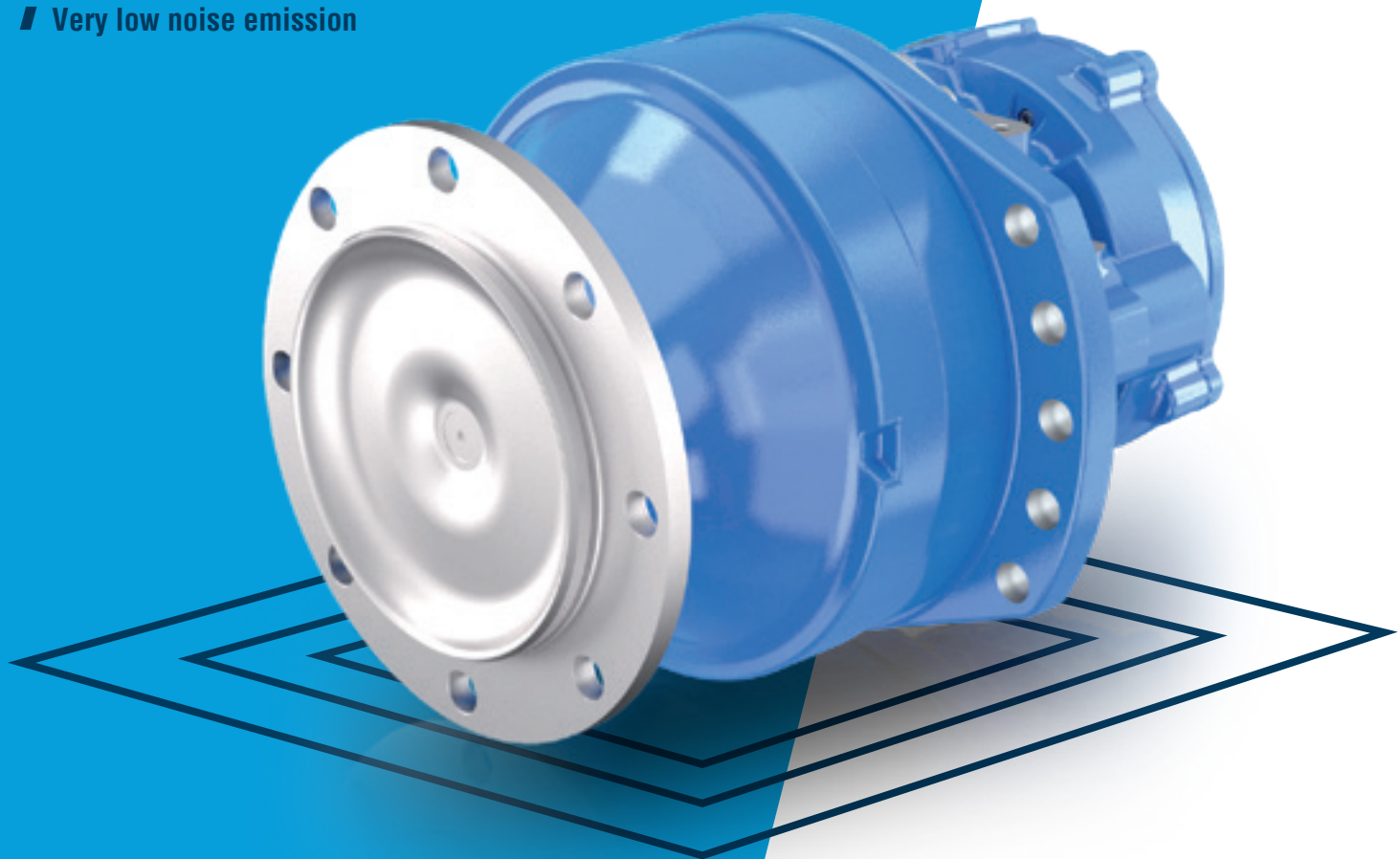
To ease the integration of our motors into your machines,
Poclain Hydraulics can supply motors with adapted torque arms and shrink discs.




| | L min. mm [in] | A dia. mm [in] | B dia. mm [in] | Mounting | Thickness mm [in] |
|---|---|---|---|---|---|
| MHP20/27 | 500 [19.68] | 290 [11.42] | 255 [10.04] | 8 x M20 | 25 [0.98] |

# MODULARITY AND VERSATILITY
## A SOLUTION FOR EVERY NEED

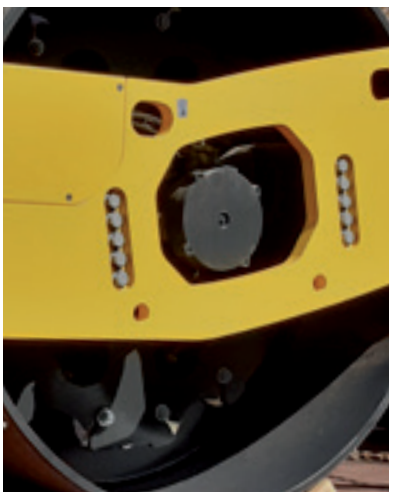
- Large range of motors
- Direct drive
- High radial and axial load capability
- Single or dual displacement
- With or without brake
- Very low noise emission



# MS / MSE

**MS/MSE02 ▪ MSE03 ▪ MS/MSE05**
**MS/MS08 ▪ MS/MSE11 ▪ MS/MSE18**
**MS25 ▪ MS35 ▪ MS50 ▪ MS83 ▪ MS125**

| |
|---|
| From 172 to 15 000 $cm^3$/rev. [10.5 to 915 cu.in/rev.] |
| Up to 77 000 N.m [56,792 lbf.ft] |
| Up to 450 bar [6,530 PSI] |
| Up to 900 rpm |
| Up to 240 kW [322 HP] |



## Performance MS Standard

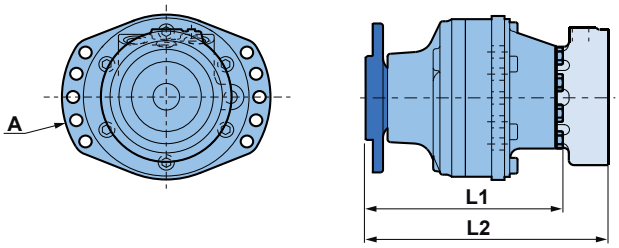
| | | First displacement* | | | | Second displacement** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
| **MS02** | 450 [6,527] | 172 - 255 [10.5] - [15.6] | 1 800 [1,227] | 580 | 18 [24] | 86 - 128 [5.2] - [7.8] | 916 [676] | 590 | 12 [16] |
| **MSE02** | 400 [5,802] | 332 - 398 [20.2] - [24.3] | 2 500 [1,843] | 265 | 22 [29.5] | 166 - 199 [10.1] - [12.1] | 1 260 [930] | 340 | 16,5 [22] |
| **MSE03** | 350 [5,076] | 450 - 500 [27.4] - [30.5] | 2 780 [2,050] | 155 | 22 [30] | 225 - 250 [13.7] - [15.2] | 1 390 [1,025] | 183 | 16,5 [22] |
| **MS05** | 450 [6,527] | 260 - 560 [15.9] - [34.2] | 4 000 [2,950] | 350 | 29 [39] | 130 - 280 [7.9] - [17.1] | 2 000 [1,475] | 360 | 19 [25] |
| **MSE05** | 400 [5,802] | 503 - 750 [30.7] - [45.7] | 4 770 [3,518] | 250 | 29 [39] | 252 - 375 [15.4] - [22.9] | 2 390 [1,762] | 300 | 19 [25] |
| **MS08** | 450 [6,527] | 467 - 934 [28.5] - [57.0] | 6 690 [4,934] | 235 | 41 [55] | 234 - 467 [14.2] - [28.5] | 3 345 [2,467] | 250 | 27 [36] |
| **MSE08** | 400 [5,802] | 1 043 - 1 248 [63.6] - [76.1] | 7 945 [5,859] | 125 | 41 [55] | 522 - 624 [31.8] - [38.1] | 3 970 [2,928] | 110 | 27 [36] |
| **MS11** | 450 [6,527] | 730 - 1 259 [44.5] - [76.8] | 9 000 [6,638] | 200 | 50 [67] | 365 - 630 [22.3] - [38.4] | 4 500 [3,319] | 200 | 33 [44] |
| **MSE11** | 400 [5,802] | 1 263 - 1 687 [77.0] - [102.9] | 10 700 [7,891] | 170 | 50 [67] | 632 - 844 [38.5] - [51.4] | 5 370 [3,960] | 190 | 33 [44] |
| **MS18** | 450 [6,527] | 1 091 - 2 099 [66.5] - [128] | 15 000 [11,063] | 170 | 70 [94] | 546 - 1 050 [33.3] - [64] | 7 520 [5,546] | 170 | 47 [63] |
| **MSE18** | 400 [5,802] | 2 340 - 2 812 [142.8] - [171.6] | 17 900 [13,202] | 90 | 70 [94] | 1 170 - 1 406 [71.4] - [85.8] | 8 950 [6,601] | 110 | 47 [63] |
| **MS25** | 450 [6,527] | 2 004- 3 006 [122.3] - [183.4] | 21 500 [15,857] | 145 | 90 [121] | 1 002- 1 503 [61.1] - [91.7] | 10 760 [7,936] | 145 | 60 [80] |
| **MS35** | 450 [6,527] | 2 439 - 4 198 [148.8] - [256] | 30 000 [22,126] | 140 | 110 [148] | 1 220 - 2 099 [74.4] - [128] | 15 000 [11,063] | 140 | 73 [98] |
| **MS50** | 450 [6,527] | 3 500 - 6 011 [213.5] - [366.6] | 43 000 [31,715] | 205 | 140 [188] | 1 750 - 3 006 [106.7] - [183.3] | 21 528 [15,878] | 225 | 93 [125] |
| **MS83** | 450 [6,527] | 6 679 - 10 019 [407.4] - [611.1] | 71 755 [52,924] | 200 | 200 [268] | 3 340 - 5 010 [203.7] - [305.5] | 35 880 [26,464] | 145 | 135 [181] |
| **MS125** | 320 - 450 [4,641 - 6,527] | 10 000 - 15 000 [69] - [915] | 77 000 [56,792] | 130 | 240 [322] | 5 000 - 7 500 [305] - [457.4] | 53 715 [39,618] | 105 | 160 [215] |

*Available for single or dual displacement motors
**Only available for dual displacement motors
***Max. theoretical torque (N.m) : 1/(20 $\pi$) x max. displacement (cm³/rev.) x max. pressure (bar)

## Dimensions MS Standard

**1C : Single displacement**
**2C : Dual displacement**

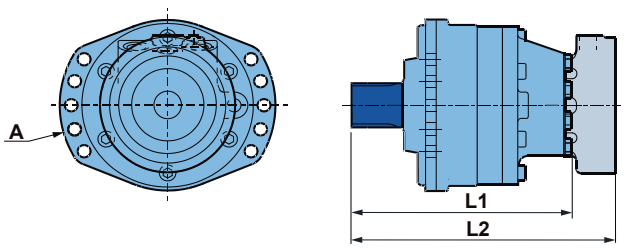
### Wheel motors




| | | | MS02 MSE02 | MSE03 | MS05 MSE05 | MS08 MSE08 | MS11 MSE11 | MS18 MSE18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 1C | mm [in] | 214,5 [8.44] | 249,5 [9.82] | 289,5 [11.40] | 305,9 [12.04] | 335,8 [13.22] | 395 [15.55] | 450,2 [17.72] | 451,2 [17.76] | 511 [20.11] | 591 [23.26] | 739 [29.09] |
| | 2C | mm [in] | 252,5 [9.94] | 251,5 [9.90] | 289,5 [11.40] | 306,7 [12.07] | 335,8 [13.22] | 375 [14.76] | 455 [17.91] | 497 [19.56] | 511 [20.11] | 591 [23.26] | 739 [29.09] |
| **L2 max.*** | 1C | mm [in] | 266 [10.47] | 292 [11.50] | 344 [13.54] | 385 [15.15] | 420,3 [16.54] | 496 [19.52] | 544 [21.41] | 584 [22.99] | 650 [25.59] | 780 [30.71] | 906 [35.67] |
| | 2C | mm [in] | 304 [11.97] | 303 [11.93] | 344 [13.54] | 385,2 [15.16] | 420,3 [16.54] | 477 [18.78] | 584 [22.99] | 630 [24.80] | 650 [25.59] | 780 [30.71] | 906 [35.67] |
| **A dia. max.** | | mm [in] | 235 [9.25] | 235 [9.25] | 300 [11.81] | 335 [13.19] | 375 [14.76] | 425 [16.73] | 485 [19.09] | 485 [19.09] | 485 [19.09] | 555,5 [21.87] | 565 [22.24] |
| **Weight max.**** | | kg [lb] | 34 [75] | 35 [77] | 55 [121] | 79 [174] | 110 [242] | 160 [352] | 280 [617] | 269 [592] | 325 [716] | 546 [1,201] | 563 [1,239] |

* Wheel motor with the longest multidiscs brake.
** Full displacement wheel motor with multidiscs brake.

### Shaft motors




| | | | MS02 MSE02 | MSE03 | MS05 MSE05 | MS08 MSE08 | MS11 MSE11 | MS18 MSE18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 1C | mm [in] | 258,1 [10.16] | - - | 312 [12.28] | 332 [13.07] | 380 [14.96] | 432 [17.00] | 520 [20.47] | 560 [22.04] | 678 [26.69] | 822 [32.36] | 822 [32.36] |
| | 2C | mm [in] | 289,5 [11.4] | - - | 312 [12.28] | 341 [13.42] | 380 [14.96] | 432 [17.00] | 538 [21.18] | 560 [22.04] | 705 [27.75] | 822 [32.36] | 822 [32.36] |
| **L2 max.*** | 1C | mm [in] | 310,5 [12.22] | - - | 370 [14.56] | 403 [15.86] | 458,5 [18.05] | 532,3 [20.95] | 652 [25.67] | 660 [25.98] | 817 [32.16] | 955 [37.60] | 962 [37.87] |
| | 2C | mm [in] | 338 [13.3] | - - | 370 [14.56] | 418 [16.45] | 458,5 [18.05] | 532,3 [20.95] | 670 [26.37] | 660 [25.98] | 850 [33.46] | 955 [37.60] | 962 [37.87] |
| **A dia. max.** | | mm [in] | 235 [8.07] | - - | 300 [11.81] | 335 [13.19] | 375 [14.76] | 425 [16.73] | 485 [19.09] | 425 [16.73] | 485 [19.09] | 565 [22.24] | 565 [22.24] |
| **Weight max.**** | | kg [lb] | 36 [79] | - - | 55 [121] | 85 [187] | 114 [251] | 147 [324] | 255 [561] | 269 [592] | 353 [778] | 527 [1,159] | 573 [1,261] |

* Shaft motor with the longest multidiscs brake.
** Full displacement shaft motor with multidiscs brake.

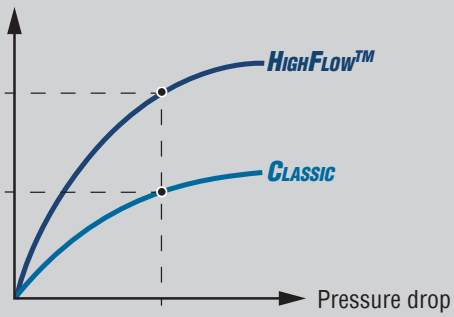
# HIGHFLOW™ AND OPTIFLOW

## Maximum productivity with a minimum consumption

The MS HighFlow™ and OptiFlow motor range has all the successful qualities of the MS Classic range.
They are modular, robust and they offer additional performance in term of speed.

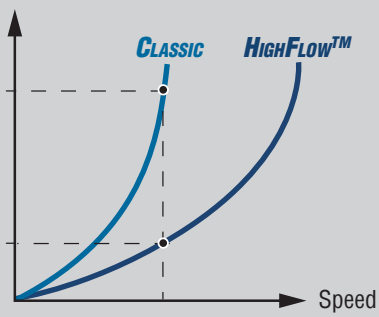
The MS OptiFlow motor keeps the same dimensions as the MS Classic motor.

**Maximum Speeds +50%**




At an equivalent pressure drop,
a HighFlow™ motor can reach higher speeds.

**Pressure Drops -50%**




At an equivalent speed,
a HighFlow™ motor reduces pressure drops.

## Performance MS HighFlow™ and OptiFlow

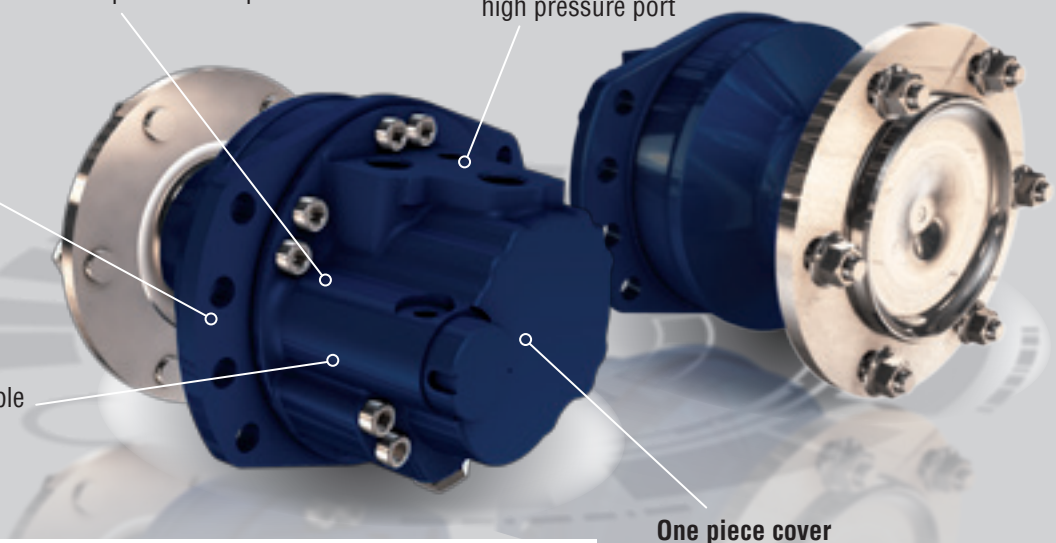
| | | First displacement* | | | | Second displacement** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
| **MS02** | 450 [6,527] | 172 - 255 [10.5] - [15.6] | 1 800 [1,227] | 850 | 18 [24] | 86 - 128 [5.2] - [7.8] | 916 [676] | 900 | 12 [16] |
| **MSE02** | 400 [5,802] | 332 - 398 [20.2] - [24.3] | 2 500 [1,843] | 440 | 22 [29.5] | 166 - 199 [10.1] - [12.1] | 1 260 [930] | 470 | 16,5 [22] |
| **MS05** | 450 [6,527] | 260 - 560 [15.9] - [34.2] | 4 000 [2,950] | 700 | 50 [67] | 130 - 280 [7.9] - [17.1] | 2 000 [1,475] | 630 | 30 [40] |
| **MSE05** | 400 [5,802] | 503 - 750 [30.7] - [45.7] | 4 770 [3,518] | 380 | 50 [67] | 252 - 375 [15.4] - [22.9] | 2 390 [1,762] | 370 | 30 [40] |
| **MS08** | 450 [6,527] | 467 - 934 [28.5] - [57.0] | 6 690 [4,934] | 450 | 41 [55] | 234 - 467 [14.2] - [28.5] | 3 345 [2,467] | 450 | 27 [36] |
| **MSE08** | 400 [5,802] | 1 043 - 1 248 [63.6] - [76.1] | 7 945 [5,859] | 210 | 41 [55] | 522 - 624 [31.8] - [38.1] | 3 970 [2,928] | 220 | 27 [36] |

*Available for single or dual displacement motors
**Only available for dual displacement motors
***Max. theoretical torque (N.m) : 1/(20 π) x max. displacement (cm³/rev.) x max. pressure (bar)

**Distribution «HighFlow™»**
Reduced pressure drop

**Flat port**
To flange a valve directly on the high pressure port

**Reinforced lug mounting**
Withstands heavy loads



**Symmetrical 2-displacement**
Identical performance in both rotation directions (not available for MS02-E02)

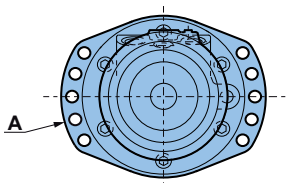
**One piece cover**
For greater resistance to the most extreme environmental conditions (available from MS02 to MS08 unbraked motors)

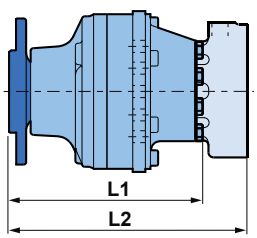
## Dimensions MS HighFlow™ and OptiFlow

**1C : One displacement**
**2C : Dual displacement**

### Wheel motors

| | | | MS02 MSE02 | MS05 MSE05 | OptiFlow MS05 MSE05 | MS08 MSE08 |
|---|---|---|---|---|---|---|
| **L1** | 1C | mm [in] | 247,9 [9.76] | 312 [12.28] | 278,7 [10.97] | 295 [11.61] |
| | 2C | mm [in] | 256,6 [10.10] | 332 [13.07] | - | 336,8 [13.26] |
| **L2 max.*** | 1C | mm [in] | 310,4 [12.22] | 380,5 [14.98] | 347,8 [13.69] | 383,2 [15.08] |
| | 2C | mm [in] | 318,2 [12.53] | 400,5 [15.76] | - | 425 [16.73] |
| **A dia. max.** | | mm [in] | 235 [9.25] | 300 [11.81] | 300 [11.81] | 335 [13.19] |
| **Weight max.**** | | kg [lb] | 39,5 [87] | 57,5 [127] | 52 [114] | 89,5 [197] |

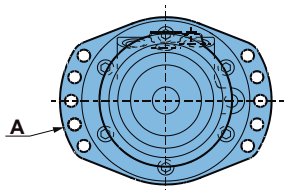


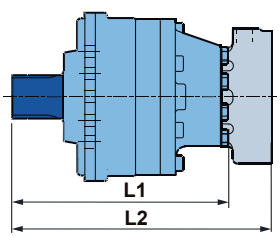




* Wheel motor with the longest multidiscs brake. ** Full displacement wheel motor with multidiscs brake.

### Shaft motors

| | | | MS02 MSE02 | MS05 MSE05 | OptiFlow MS05 MSE05 | MS08 MSE08 |
|---|---|---|---|---|---|---|
| **L1** | 1C | mm [in] | 258,1 [10.16] | 331,5 [13.05] | 306,7 [12.07] | 340 [13.38] |
| | 2C | mm [in] | 289,5 [11.4] | 351,5 [13.84] | - | 356 [14.02] |
| **L2 max.*** | 1C | mm [in] | 310,5 [12.22] | 400 [15.75] | 375,7 [14.79] | 392 [15.43] |
| | 2C | mm [in] | 338 [13.3] | 420 [16.53] | - | 409 [16.10] |
| **A dia. max.** | | mm [in] | 235 [8.07] | 300 [11.81] | 300 [11.81] | 335 [13.19] |
| **Weight max.**** | | kg [lb] | 41,5 [91] | 60,5 [133] | 55 [121] | 90,5 [199] |




* Shaft motor with the longest multidiscs brake. ** Full displacement shaft motor with multidiscs brake.

## Bearing support types

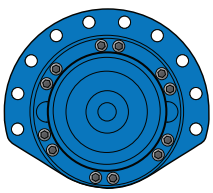





| | Wheel flange | Male splined shaft | Keyed shaft | Female splined shaft | Shaft for shrink disc | Dual sprocket shaft |
|---|---|---|---|---|---|---|
| | | NF E 22141<br>DIN 5480 | | DIN 5480 | | |
| MS02-E02 | ● | ● | ● | | | ● |
| MSE03 | ● | | | | | |
| MS05-E05 | ● | ● | ● | | | ● |
| MS08-E08 | ● | ● | ● | | | |
| MS11-E11 | ● | ● | | | | |
| MS18-E18 | ● | ● | ● | | ● | |
| MS25 | ● | ● | | | ● | |
| MS35 | ● | ● | | | ● | |
| MS50 | ● | ● | | ● | ● | |
| MS83 | ● | ● | | ● | ● | |
| MS125 | ● | ● | | ● | ● | |

## Chassis fixation types

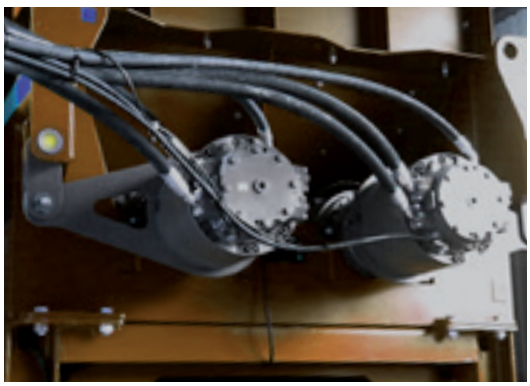


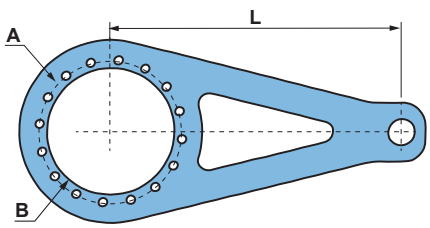



| | On the valving cover<br>Two lugs | On the bearing support<br>Two lugs | On the bearing support<br>Circular | Horse shoe |
|---|---|---|---|---|
| MS02-E02 | ● | ● | | |
| MSE03 | ● | ● | | |
| MS05-E05 | ● | ● | | ● |
| MS08-E08 | ● | ● | | |
| MS11-E11 | ● | ● | | |
| MS18-E18 | ● | ● | | |
| MS25 | ● | ● | | |
| MS35 | ● | ● | ● | |
| MS50 | ● | | ● | |
| MS83 | ● | | ● | |
| MS125 | ● | | ● | |

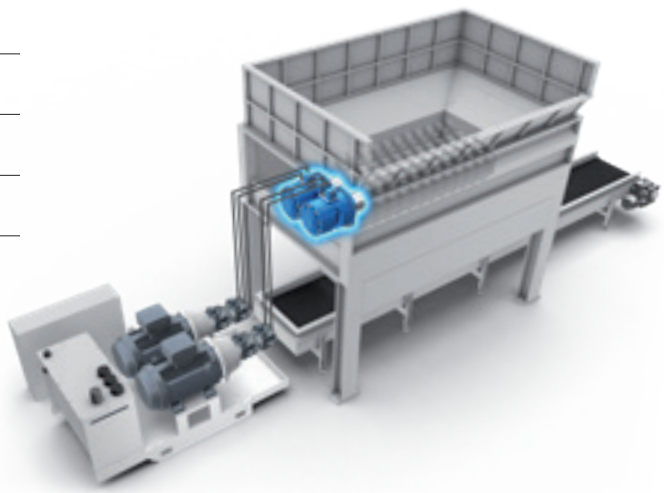
## Torque arms and shrink discs

To ease the integration of our motors into your machines,
Poclain Hydraulics can supply motors with adapted torque arms and shrink discs.






| | L min. mm [in] | A dia. mm [in] | B dia. mm [in] | Mounting | Thickness mm [in] |
|---|---|---|---|---|---|
| **MS35** | 500 [19.68] | 290 [11.42] | 255 [10.04] | 8 x M20 | 25 [0.98] |
| **MS50** | 600 [23.62] | 340 [13.39] | 300 [11.81] | 12 x M20 | 40 [1.57] |
| **MS83** | 800 [31.5] | 380 [14.96] | 340 [13.38] | 16 x M20 | 40 [1.57] |
| **MS125** | 800 [31.5] | 394 [15.51] | 352 [13.85] | 16 x M24 | 40 [1.57] |



MS125 motor
with shrink discs

# Brakes

## Multidisc parking brake mounted at the rear of the motor

- T brake: brake with reinforced rear plate
- Parking brake release pressure: 12 to 30 bar [174 to 435 PSI]

MS05
with T04 brake

**Max. parking braking torque**

| | N.m [lb.ft] | MS02 MSE02 | MSE03 | MS05 MSE05 | MS08 MSE08 | MS11 MSE11 | MS18 MSE18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **T03** | 2 500 [1,840] | ● | ● | | | | | | | | | |
| **T04** | 4 220 [3,110] | | | ● | | | | | | | | |
| **T08** | 5 620 [4,150] | | | | ● | | | | | | | |
| **T09** | 9 000 [6,640] | | | | ● | | | | | | | |
| **T12** | 11 840 [8,730] | | | | | ● | ● | | ● | | | |
| **T19** | 18 600 [13,720] | | | | | | ● | | ● | | | |
| **T21** | 20 900 [15,415] | | | | | | | ● | ● | ● | | |
| **T30** | 30 000 [22,130] | | | | | | | ● | ● | ● | | |
| **T83** | 42 000 [30,980] | | | | | | | | | ● | | |
| **T80** | 72 000 [53,104] | | | | | | | | | | ● | ● |

## Multidisc parking brake mounted in the bearing support

- Parking brake release pressure: 16 to 30 bar [232 to 435 PSI]
- Negative brake

MS08
with S08 and T08 brakes

MS18
with S20 or P20 brake

**Mini. parking braking torque**

| | N.m [lb.ft] | MS05/E05 | MS11/E11 | MS18/E18 | MS35 |
|---|---|---|---|---|---|
| **P05** | 4 500 [3,320] | ● | | | |
| **P17** | 16 000 [11,801] | | ● | | |
| **P20** | 20 000 [14,751] | | | ● | ● |
| **P27** | 19 800 [14,604] | | | ● | ● |

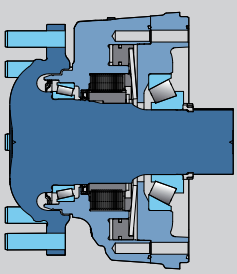
## Multidisc service brake mounted in the bearing support

- Pressure to obtain max. service braking torque: 120 bar [1,740 PSI]
- Positive brake

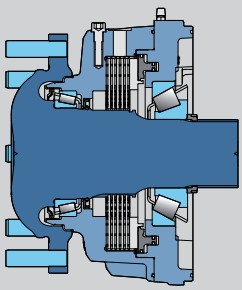
**Average service braking torque**

| | N.m [lb.ft] | MS05/MSE05 | MS08/MSE08 | MS11/E11 | MS18/E18 | MS35 |
|---|---|---|---|---|---|---|
| **S08** | 6 000 [4,425] | ● | ● | | | |
| **S17** | 22 000 [16,226] | | | ● | | |
| **S20** | 25 000 [18,439] | | | | ● | ● |

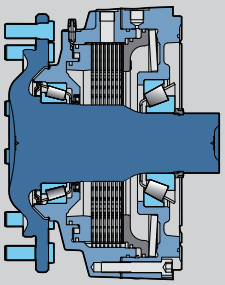
Parking brake
on the bearing support (P)



Service brake
on the bearing support (S)



Combined parking & service brake
on the bearing support (C)



## Multidisc parking and service brake mounted in the bearing support

- Parking brake release pressure: 12 to 30 bar [174 to 435 PSI] for C03 and 100 to 130 bar [1,450 to 1,885 PSI] for C27
- Negative brake
- Pressure to obtain max. service braking torque: 120 bar [1,740 PSI] for C03 and 70 bar [1,015 PSI] for C27
- Positive brake

MS18
with C27 brake

**Mini. parking and average service braking torque**

| | Parking | Service | | | |
|---|---|---|---|---|---|
| | N.m [lb.ft] | N.m [lb.ft] | MS02/E02 | MS18/E18 | MS35 |
| **C03** | 2 645 [1,951] | 1 580 [1,165] | ● | | |
| **C27** | 18 000 [13,276] | 32 000 [23,602] | | ● | ● |

## Caliper brake

**Max. service braking torque**

| mm | N.m [lb.ft] | MS02 MSE02 |
|---|---|---|
| **Dia. 302** | 1 930 [1,423] | ● |

MS02
with caliper brake

# BOOSTED BRAKE

## More security for self-propelled machines

Improve the braking performance of self-propelled machines by using the entirely hydrostatic braking capacity of hydraulic motors. The technology - Boosted Brake - meets the braking requirements for machines running at 40 kph [24.8 mph].

On a self-propelled machine running at 40 kph [24.8 mph] the hydrostatic brake must be combined with a friction brake to meet European regulations of deceleration.
Poclain Hydraulics has developed a technology - Boosted Brake - to increase the hydrostatic braking capacity of self-propelled machines.

**Motor sizes**

- MS-MSE18
- MS35
- MHP11
- MHP13
- MHP17
- MHP20
- MHP27

More information > Page 134

## Optional features

### Temperature control

| | MS02-E02 | MSE03 | MS05-E05 | MS08-E08 | MS11-E11 | MS18-E18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Exchange valve | ● | | ● | ● | ● | ● | | ● | | | |
| High efficiency (zero clearance pistons/ring) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Additional case flushing port | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

### Speed

| | MS02-E02 | MSE03 | MS05-E05 | MS08-E08 | MS11-E11 | MS18-E18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| High speed / Low pressure drop (Butterfly valving) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Speed sensor | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

### Reinforcement

| | MS02-E02 | MSE03 | MS05-E05 | MS08-E08 | MS11-E11 | MS18-E18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Extra long life (Diamond™) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| PEEK bushing (against high temperature) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Reinforced back plate | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Monobloc cover | | | ● | ● | | | | | | | |

### High pressure connection

| | MS02-E02 | MSE03 | MS05-E05 | MS08-E08 | MS11-E11 | MS18-E18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAE Flange | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Metric | ● | | ● | ● | ● | ● | | ● | | | |
| UNF | ● | ● | ● | ● | ● | ● | | ● | | | |
| Manifold interface | | | ● | ● | ● | ● | | | | ● | ● |
| GAS | ● | ● | ● | ● | ● | ● | | ● | | | ● |

### Hollow shaft (only for splined shaft motor)

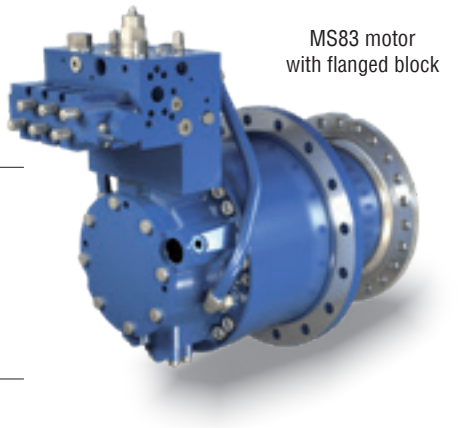
| MS02-E02 | MSE03 | MS05-E05 | MS08-E08 | MS11-E11 | MS18-E18 | MS25 | MS35 | MS50 | MS83 | MS125 |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |

## Flanged block for integrated power control unit

Single Poclain Hydraulics product: one part number, one source.

No hoses between the motor and the valve: less parts, les cost, less space, increased safety and better efficiency.

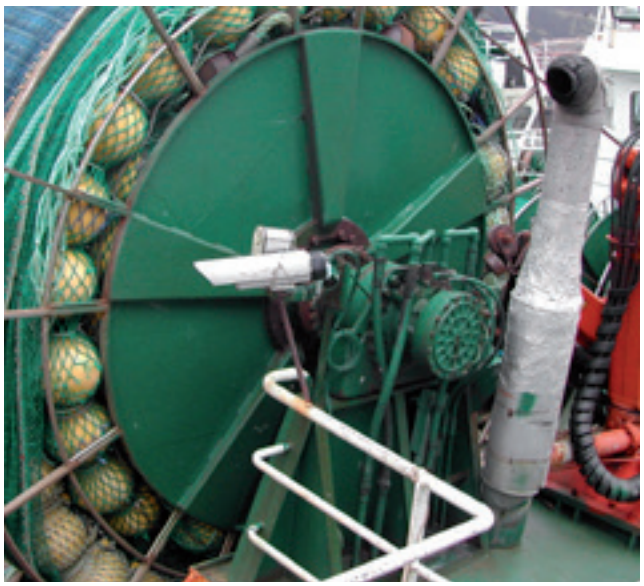
Modular design: all versions and options are available. Several functions in the same block



MS83 motor with flanged block

**Available functions**

- Anti-cavitation
- Cross-over relief
- Counter balance
- Free-wheeling
- Cold start
- Back pressure



# TWIN-LOCK™ : FULLY HYDROSTATIC ANTI-SKID SOLUTION

## Increase the off-road capability of your machines

Wheel adherence is a critical factor with off road vehicles. Lose adequate wheel contact with the ground and you can lose control of your machine, put it temporarily out of service, cause premature tire wear, dramatically increase fuel consumption or churn up the site. Poclain Hydraulics, a specialist in hydrostatic transmission, has designed and developed Twin-Lock™ to increase the performance of its hydrostatic drive systems on difficult ground conditions and steep gradients.

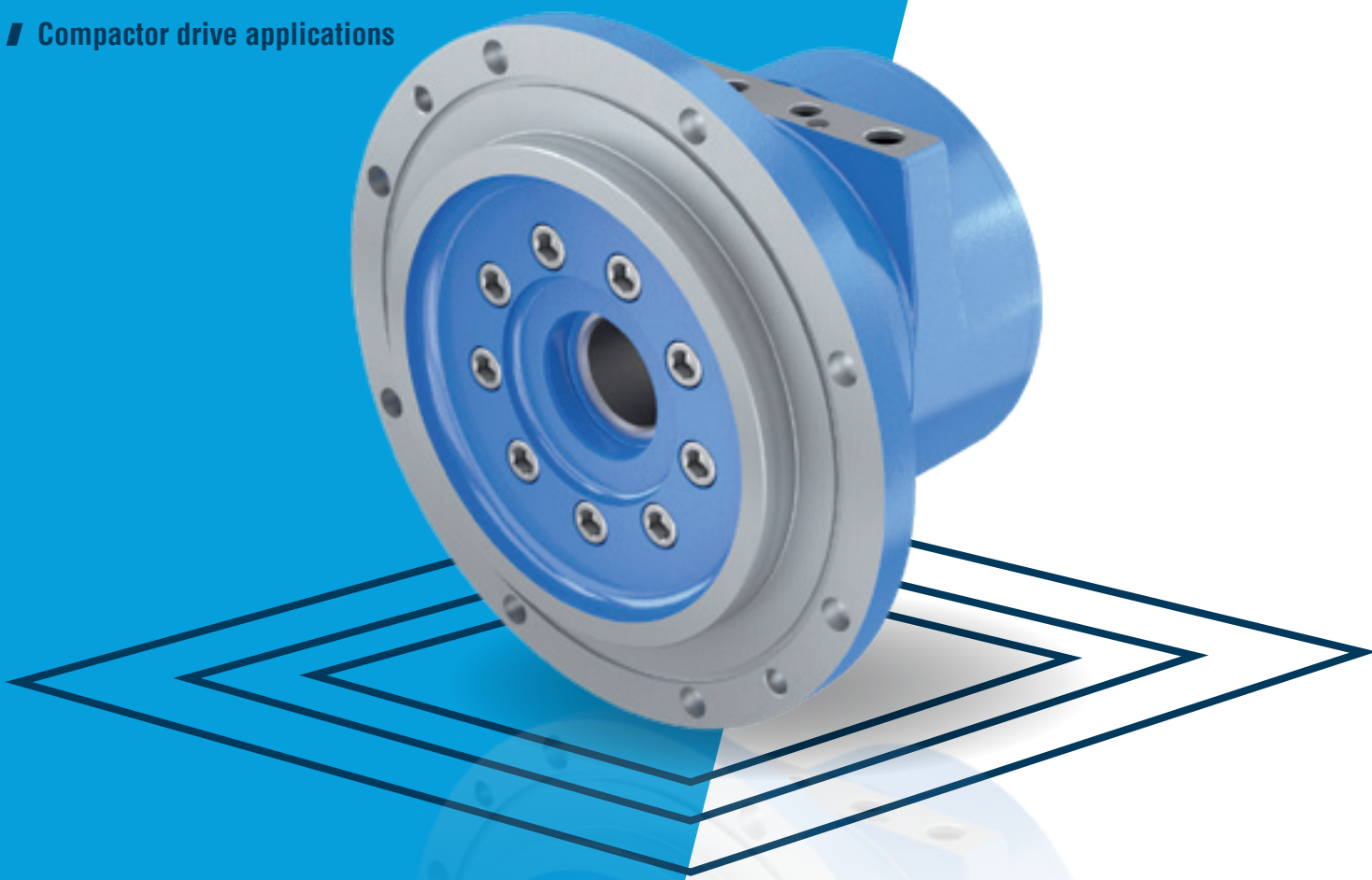
**Motor sizes**

- MS-MSE02
- MSE03
- MS-MSE05
- MS-MSE08
- MS-MSE11
- MS-MSE18
- MS35
- MS50


More information > Page 126

# COMPACTNESS
## THE SHORTEST AXIAL DIMENSION

- Ultra-short motors
- Large diameter 4 contact roller bearing
- Single or dual displacement
- With or without brake
- Compactor drive applications



# MK / MKD / MKE

## MK/MKD04 ▪ MK05
## MK09 ▪ MK/MKE12

| |
|---|
| From 272 to 1 356 $cm^3$/rev. [16.6 to 82.7 cu.in/rev.] |
| Up to 9 710 N.m [7,162 lbf.ft] |
| Up to 450 bar [6,530 PSI] |
| Up to 130 rpm |
| Up to 41 kW [55 HP] |

## Performance

| | | First displacement* | | | | Second displacement** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
| **MK04** | 400 [5,802] | 272 - 408 [16.6] - [24.9] | 2 600 [1,918] | 120 | 18 [24] | - - | - - | - | - - |
| **MKD04** | 400 [5,802] | 456 - 545 [27.8] - [33.2] | 3 470 [2,559] | 90 | 18 [24] | - - | - - | - | - - |
| **MK05** | 400 [5,802] | 272 - 670 [16.6] - [40.9] | 4 265 [3,146] | 130 | 22,5 [30] | - - | - - | - | - - |
| **MK09** | 400 [5,802] | 667 - 1 000 [40.7] - [61.0] | 6 370 [4,698] | 100 | 30 [40] | - - | - - | - | - - |
| **MK12** | 450 [6,527] | 627 - 934 [38.2] - [57.0] | 6 690 [4,934] | 100 | 41 [55] | 313 - 467 [19.1] - [28.5] | 3 345 [2,467] | 100 | 27 [36] |
| **MKE12** | 450 [6,527] | 1 043 - 1 356 [63.6] - [82.7] | 9 710 [7,162] | 100 | 41 [55] | 521 - 678 [31.8] - [41.4] | 4 855 [3,581] | 100 | 27 [36] |

*Available for single or dual displacement motors
**Only available for dual displacement motors
***Max. theoretical torque (N.m) : 1/(20 π) x max. displacement (cm³/rev.) x max. pressure (bar)

## Chassis fixation types

| | On the bearing support Circular | On the valving cover Two lugs | From rear of motor |
|---|---|---|---|
| **MK04** | ● | | |
| **MKD04** | ● | | |
| **MK05** | | | ● |
| **MK09** | | | ● |
| **MK12** | | ● | |
| **MKE12** | | ● | |

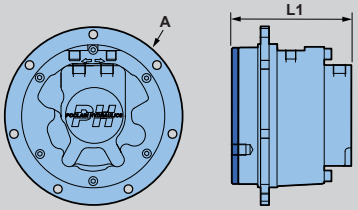
## Dimensions

**1C : One displacement**
**2C : Dual displacement**

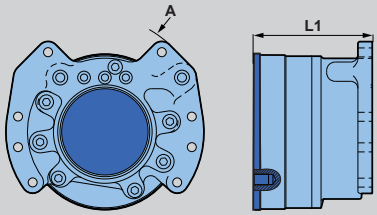
| | | | MK04 | MKD04 | MK05 axial | MK05 radial | MK09 | MK12 MKE12 |
|---|---|---|---|---|---|---|---|---|
| **L1** | 1C | mm [in] | 172,7 [6.80] | 176,2 [6,93] | 165 [6,5] | 146,5 [5.77] | 247,6 [9.75] | 249 [9.8] |
| | 2C | mm [in] | - [-] | - [-] | - [-] | - [-] | - [-] | 283 [11.14] |
| **L2 max.*** | 1C | mm [in] | - [-] | - [-] | - [-] | - [-] | - [-] | - [-] |
| | 2C | mm [in] | - [-] | - [-] | - [-] | 203,5 [8.01] | - [-] | - [-] |
| **A dia. max.** | | mm [in] | 256 [10.08] | 256 [10.08] | 302 [11.89] | 240 [9.45] | 335 [13.81] | 355 [13.19] |
| **Weight max.**** | | kg [lb] | 31 [68] | 32 [70] | 35 [77] | 40 [88] | 72 [158] | 82 [180] |

* Wheel motor with the longest multidiscs brake.
** Full displacement wheel motor with multidiscs brake.

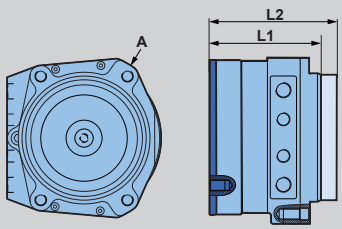
MK04 / MKD04



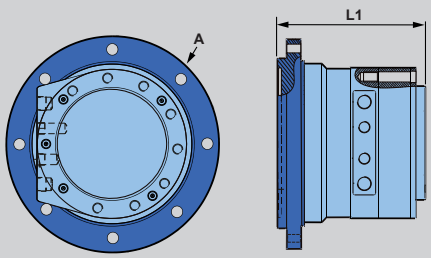

MK05 axial ports



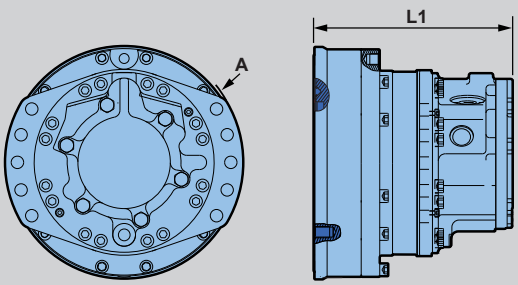

MK05 radial (with optional rear brake)




MK09




MK12-MKE12



# Brakes

## Multidisc parking brake mounted at the rear of the motor

- Parking brake release pressure: 12 to 30 bar [174 to 435 PSI]

**Max. parking braking torque**

| | N.m [lb.ft] | MK05 |
|---|---|---|
| **T04** | 3 600 [2,655] | ● |
| **T07** | 7000 [5,160] | ● |

MK05 with brake mounted at the rear of the motor

## Multidisc integrated parking brake

- Parking brake release pressure: 12 to 30 bar [174 to 435 PSI]

**Max. parking braking torque**

| | N.m [lb.ft] | MK09 |
|---|---|---|
| **Integrated brake** | 6050 [4,460] | ● |

MK09 with integrated brake and hollow shaft

## Multidisc parking brake mounted in the bearing support

- Parking brake release pressure: 12 to 30 bar [174 to 435 PSI]

**Max.parking braking torque**

| | N.m [lb.ft] | MK12 MKE12 |
|---|---|---|
| **Brake in bearing support** | 9 000 [6,640] | ● |

## Claw brake

- Parking brake release pressure: 17 to 30 bar [246 to 435 PSI]

**Max. parking braking torque**

| | N.m [lb.ft] | MK04 | MKD04 | MK05* |
|---|---|---|---|---|
| **Claw brake** | 3 170 [2,338] | ● | ● | |
| | 3 500 [2,580] | | | ● |

* With axial ports

MK04 with Claw brake

# Optional features

## Temperature control

| | MK04 | MKD04 | MK05 | MK09 | MK12 |
|---|---|---|---|---|---|
| Exchange valve | | | | | |
| High efficiency (zero clearance pistons/ring) | | ● | | ● | ● |
| Additional case flushing port | ● | | | ● | ● |

## Speed

| | MK04 | MKD04 | MK05 | MK09 | MK12 |
|---|---|---|---|---|---|
| High speed / Low pressure drop (Butterfly valving) | | ● | | | |
| Speed sensor | ● | ● | ● | ● | ● |

## Reinforcement

| | MK04 | MKD04 | MK05 | MK09 | MK12 |
|---|---|---|---|---|---|
| Extra long life (Diamond™) | | ● | | ● | ● |
| PEEK bushing (against high temperature) | ● | ● | ● | ● | ● |
| Reinforced back plate | | | | | ● |
| Brake lock plate (for high speed motor fixation) | | | | ● | |
| Reinforced front flange | ● | ● | ● | ●* | ● |

* Standard

## Hollow shaft

| MK04 | MKD04 | MK05 | MK09 | MK12 |
|---|---|---|---|---|
| ● | ● | ● | ●* | ● |

* Standard

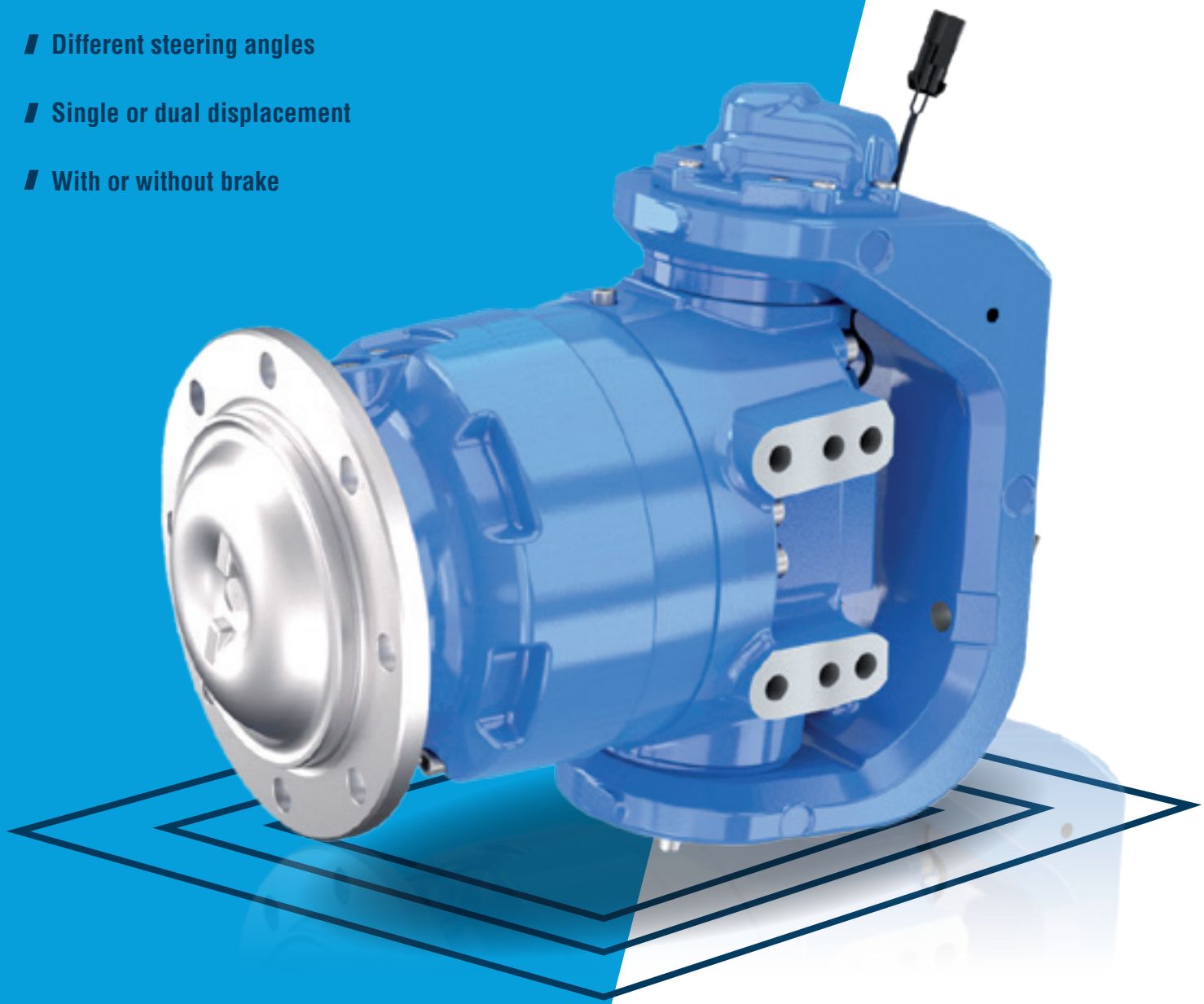
MK12 with hollow shaft

MK09 with hollow shaft

# STEERABLE WHEEL MOTORS

## EASY MOTORIZATION OF STEERING WHEELS

- Integrated pivot
- Different steering angles
- Single or dual displacement
- With or without brake



# MG / MGE

## MG/MGE02 ▪ MG/MGE05
## MG/MGE11 ▪ MG21

| |
|---|
| From 172 to 2 519 $cm^3$/rev. [10.5 to 153 cu.in/rev.] |
| Up to 16 030 N.m [11,823 lbf.ft] |
| Up to 450 bar [6,530 PSI] |
| Up to 510 rpm |
| Up to 80 kW [107 HP] |

## Performance

| | First displacement* | | | | Second displacement** | | | |
|---|---|---|---|---|---|---|---|---|
| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
| **MG02** | 450 [6,527] | 172 - 255 [10.5] - [15.6] | 1 800 [1,227] | 390 | 18 [24] | 86 - 128 [5.2] - [7.8] | 916 [676] | 510 | 12 [16] |
| **MGE02** | 400 [5,802] | 332 - 398 [20.2] - [24.3] | 2 500 [1,843] | 200 | 22 [29.5] | 166 - 199 [10.1] - [12.1] | 1 260 [930] | 275 | 16,5 [22] |
| **MG05** | 450 [6,527] | 260 - 560 [15.9] - [34.2] | 4 010 [2,957] | 420 | 29 [39] | 130 - 280 [7.9] - [17.1] | 1 862 [1,373] | 420 | 19 [35] |
| **MGE05** | 400 [5,802] | 503 - 749 [30.7] - [45.7] | 4 768 [3,517] | 225 | 29 [39] | 251 - 374 [15.3] - [22.8] | 3 202 [2,361] | 275 | 19 [35] |
| **MG11** | 450 [6,527] | 730 - 1 259 [44.5] - [76.8] | 9 000 [6,638] | 200 | 50 [67] | 365 - 630 [22.3] - [38.4] | 4 500 [3,319] | 200 | 33 [44] |
| **MGE11** | 400 [5,802] | 1 263 - 1 687 [77.0] - [102.9] | 10 700 [7,891] | 170 | 50 [67] | 632 - 844 [38.5] - [51.4] | 5 370 [3,960] | 190 | 33 [44] |
| **MG21** | 400 [5,802] | 1 674 - 2 519 [102.1] - [153.6] | 16 030 [11,823] | 138 | 80 [107] | 837 - 1 260 [51.0] - [76.8] | 8 020 [5,915] | 138 | 53 [71] |

*Available for single or dual displacement motors
**Only available for dual displacement motors
***Max. theoretical torque (N.m) : 1/(20 π) x max. displacement (cm³/rev.) x max. pressure (bar)

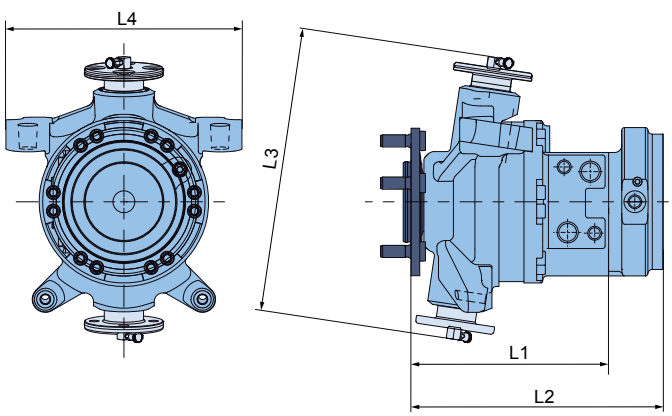
## Dimensions

**1C : One displacement**
**2C : Dual displacement**

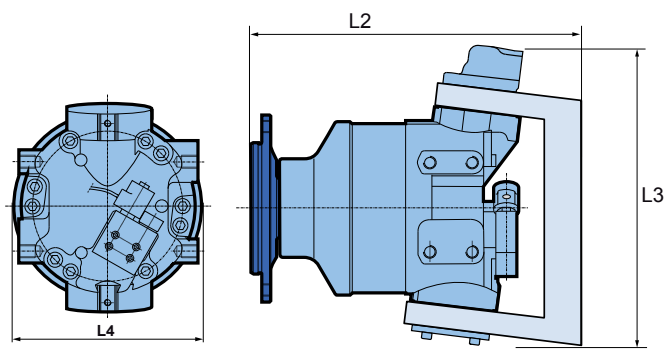
| | | | MG02 MGE02 | MG05 MGE05 | MG11 MGE11 | MG21 MGE21 |
|---|---|---|---|---|---|---|
| **L1** | 1C | mm [in] | 215,1 [6,47] | - - | - - | - - |
| | 2C | mm [in] | 251,4 [9.90] | - - | - - | - - |
| **L2 max.*** | 1C | mm [in] | 262,9 [10.35] | 426 [16.77] | 513 [20.20] | 554 [21.81] |
| | 2C | mm [in] | 290,4 [11.43] | 426 [16.77] | 513 [20.20] | 554 [21.81] |
| **L3** | | mm [in] | 326,5 [12.85] | 442 [17.40] | 505 [19.88] | 505 [19.88] |
| **L4** | | mm [in] | 270 [10.63] | 224 [8.81] | 314 [12.36] | 314 [12.36] |
| **Weight max.**** | | kg [lb] | 47,8 [105.2] | 97 [213] | 210 [463] | 230 [507] |

* Wheel motor with the longest multidiscs brake.
** Two displacements wheel motor with multidiscs brake.

MG02-MGE02




MG05-MGE05 / MG11-MGE11 / MG21



# PLUG AND PLAY MOTOR

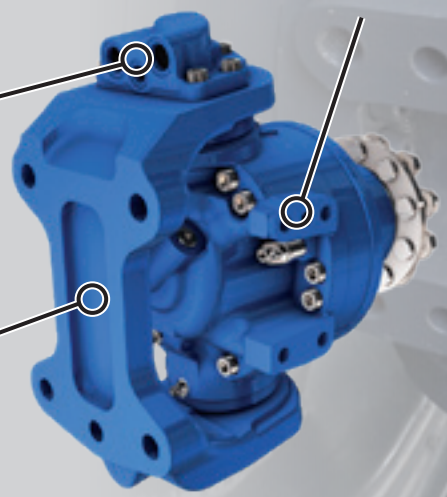
## Easy integration onto the chassis

The MG motor optimizes the design of motorized steering wheels. The integration of the pivot function, steering attachments and bevel stops on the casing of the MG motor, simplify the assembly of motorized steering wheels on a chassis.

**Integrated steering bracket attachment**
Available on MG05/E05, MG11/E11 and MG21

**Hydraulic pivot for easy piping**
- No movement of high pressure pipes
- Avoid pipe damage
- Optimized length of pipes
- On MG05/E05, MG11/E11 and MG21

**C-Frame**
Direct mounting on machine axle



## Brakes

### Multidisc brake

- T brake: brake with reinforced rear plate
  (release pressure: 12 to 30 bar [174 to 435 PSI])
- P brake: brake mounted in the bearing support
  (release pressure: 16 to 30 bar [232 to 435 PSI])

**Max. parking braking torque**

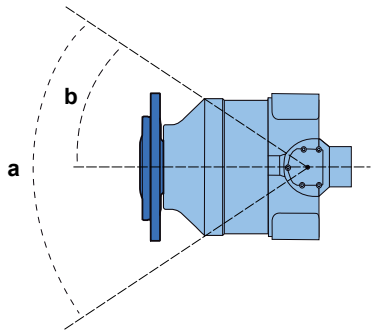
| | N.m [lb.ft] | MG02 MGE02 | MG05 MGE05 | MG11 MGE11 |
|---|---|---|---|---|
| **T03** | 2 500 [1,840] | ● | | |
| **P05** | 4 500 [3,320] | | ● | |
| **P16** | 11 000 [8,113] | | | ● |

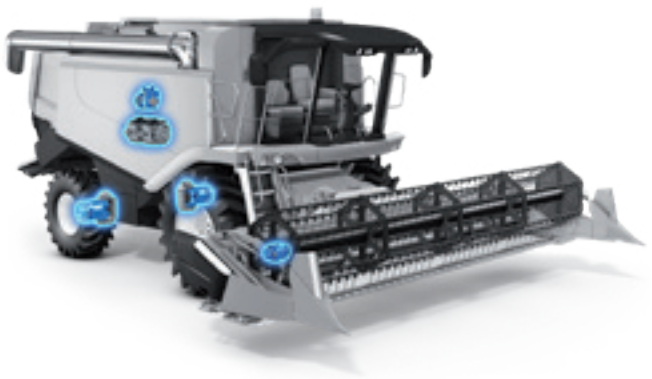
MG05 motor
with multidisc brake
in the bearing support

MG11 motor
with multidisc brake
in the bearing support

## Steering angle

| | MG05<br>MGE05 | MG11<br>MGE11 | MG21 | MG02<br>MGE02 |
|---|---|---|---|---|
| **Angle a** | 90° | 80° | 80° | The steering angles a and b can be differents within the limits of the customer's chassis conception and the hydraulics connections. The steering angle is adjusted with the steering stop screws. |
| **Angle b** | 45° | 40° | 40° | |

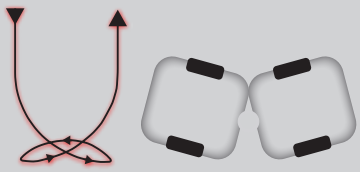


# ENHANCED STEERING ANGLE

Compared to a vehicle equipped with an articulated chassis, a vehicle fitted with motorized steering wheels offers a better steering angle and can consequently perform u-turns in a smaller radius using fewer movements.

Articuled chassis



Chassis with motorized steering wheels

3 steering modes available:

On the front wheel for road transfers

Four wheel steer to tighten the turning radius

Crab steering for sideways machine move-ment

## Optional features

### Temperature control

| | MG02-E02 | MG05-E05 | MG11-E11 | MG21 |
|---|---|---|---|---|
| High efficiency (zero clearance pistons/ring) | ● | ● | | |
| Additional case flushing port | ● | | | |

### Speed

| | MG02-E02 | MG05-E05 | MG11-E11 | MG21 |
|---|---|---|---|---|
| High speed / Low pressure drop (Butterfly valving) | ● | ● | | |
| Speed sensor | ● | ● | ● | ● |

### Reinforcement

| | MG02-E02 | MG05-E05 | MG11-E11 | MG21 |
|---|---|---|---|---|
| Extra long life (Diamond™) | ● | ● | ● | ● |

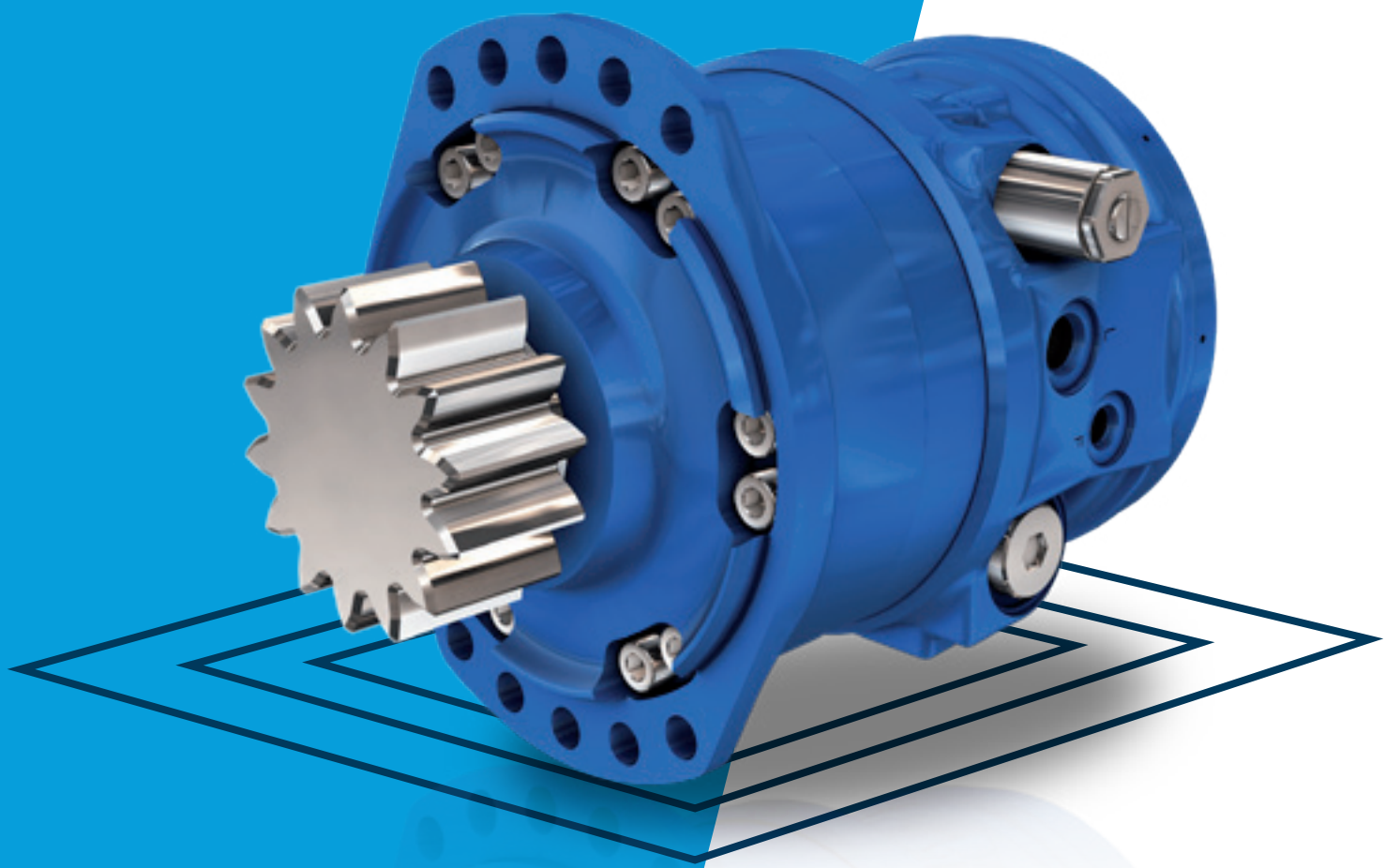
### High pressure connection

| | MG02-E02 | MG05-E05 | MG11-E11 | MG21 |
|---|---|---|---|---|
| SAE Flange | ● | | | |
| Metric | ● | ● | ● | ● |
| UNF | ● | ● | ● | ● |

# SWING DRIVE

## SMOOTH AND PRECISE SWING DRIVE

- Compact motors
- Large choice of pinions
- Integrated shockless or anti-rebound valves
- Integrated brake



# MZ /MZE

## MZ/MZE02 ▪ MZE03 ▪ MZ/MZE05

| |
|---|
| From 213 to 750 cm³/rev. [13.0 to 45.7 cu.in/rev.] |
| Up to 3 100 N.m [2,286 lbf.ft] |
| Up to 260 bar [3,771 PSI] |
| Up to 470 rpm |
| Up to 29 kW [39 HP] |

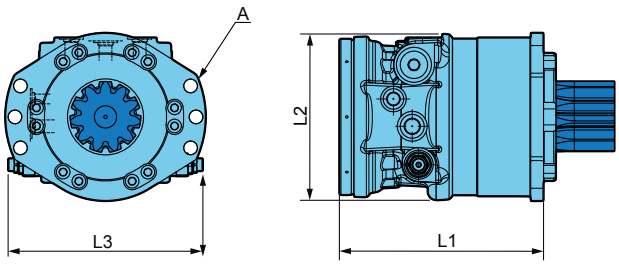
## Performance

| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque* N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
|---|---|---|---|---|---|
| **MZ02** | 260 [3,771] | 213 - 255 [13.0] - [15.6] | 1 055 [778] | 470 | 18 [24] |
| **MZE02** | 260 [3,771] | 332 - 398 [20.2] - [24.3] | 1 650 [1,217] | 265 | 22 [30] |
| **MZE03** | 260 [3,771] | 450 - 500 [27.5] - [30.5] | 2 070 [1,526] | 155 | 22 [30] |
| **MZ05** | 260 [3,771] | 468 - 560 [28.6] - [34.2] | 2 320 [1,711] | 240 | 29 [39] |
| **MZE05** | 260 [3,771] | 625 - 750 [38.1] - [45.7] | 3 100 [2,286] | 190 | 29 [39] |

*Max. theoretical torque (N.m) : 1/(20 π) x max. displacement (cm³/rev.) x max. pressure (bar)

## Dimensions

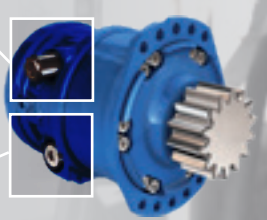
| | | MZ02-MZE02 | MZE03 | MZ05-MZE05 |
|---|---|---|---|---|
| **L1** | mm [in] | 239 [9.41] | 219 [8.62] | 266,3 [10.48] |
| **L2** | mm [in] | 195 [7.68] | 195 [7.68] | 228 [8.98] |
| **L3** | mm [in] | 228 [8.97] | 222 [8.74] | 294 [11.57] |
| **A dia. max.** | mm [in] | 340 [13.39] | 302 [11.89] | 300 [11.81] |
| **Weight max.** | kg [lb] | 42 [93] | 46 [101] | 65 [143] |




# SMOOTH AND PRECISION

## Built-in pressure relief and check valves

The built-in valves ensure smoother acceleration or deceleration of the turret. Coupled with the radial piston motor technology, these valves guarantee extremely accurate positioning of the mini-excavator boom.
The technical characteristics of the MZ motor - no gear box and low internal leakages - reduce turret drifting when operating on slopes.



**Pressure relief valve with or without dynamic shockless behavior**
Limits the pressure in the high pressure lines of the hydraulic motor.
Allows the absorption of the pressure peaks.

**Check valve**
Allows to compensate for leakages to prevent cavitation.

## Pinion types

| | | MZ02-MZE02 | | | | MZE03 | | MZ05-MZE05 | |
|---|---|---|---|---|---|---|---|---|---|
| **Norm** | | NF ISO 53 | NF ISO 53 | NF ISO 53 | NF ISO 53 | NF ISO 53 | NF ISO 53 | NF ISO 53 | NF ISO 53 |
| **Module** | | 6 | 5 | 5 | 4,5 | 6 | 7 | 8 | 8 |
| **Number of teeth** | | 14 | 17 | 14 | 11 | 14 | 12 | 12 | 11 |
| **Pitch diameter** | mm<br>[in] | 84<br>[3.31] | 85<br>[3.35] | 70<br>[2.76] | 49,5<br>[1.95] | 84<br>[3.31] | 84<br>[3.31] | 96<br>[3.78] | 88<br>[3.46] |
| **Pressure angle** | | 20° | 20° | 20° | 20° | 20° | 20° | 20° | 20° |

## Brakes

### Multidisc brake mounted at the rear of the motor

**Max. braking torque**

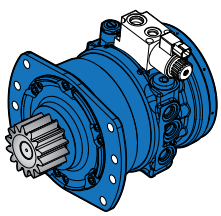
| N.m [lb.ft] | MZ02-MZE02 | MZE03 | MZ05-MZE05 |
|---|---|---|---|
| 1 100 [810] | ● | | |
| 1 830 [1,350] | ● | | |
| 2 200 [1,620] | | ● | |
| 4 910 [3,621] | | | ● |

Integrated multidisc brake

### Automatic de-braking valve

De-braking valve controls time for braking / brake release of the hydraulic motor´s static brake.

| | MZ02-MZE02 | MZE03 | MZ05-MZE05 |
|---|---|---|---|
| **Hydraulic** | | ● | ● |
| **Electrical** | ● | ● | |



Electrical de-braking valve

## FOR EXCAVATORS UP TO 24 TONS

### MS Motors with pinion shaft

Thanks to its modular design, high performance and reliability, the MS motor is also a perfect solution for swing-drive of small / medium excavators.

| | Displacement range cm³/rev [cu.in/rev] | Max. Torque* N.m [lbf.ft] | Excavator size |
|---|---|---|---|
| **MS08** | 467 - 934<br>[28.5] - [57.0] | 3 850<br>[2,840] | Up to 13 tons |
| **MSE08** | 1 043 - 1 248<br>[63.6] - [76.2] | 5 150<br>[3,796] | |
| **MS11** | 730 - 1 259<br>[44.5] - [76.8] | 5 200<br>[3,835] | Up to 18 tons |
| **MSE11** | 1 263 - 1 687<br>[77.1] - [102.9] | 6 950<br>[5,126] | |
| **MS18** | 1 091 - 1 911<br>[66.6] - [116.6] | 7 900<br>[5,827] | Up to 24 tons |
| **MSE18** | 2 340 - 2 812<br>[142.8] - [171.6] | 11 600<br>[8,556] | |

*Theoretical torque at 260 bar [3771 PSI]

MS Motors with shockless or anti-rebound valve

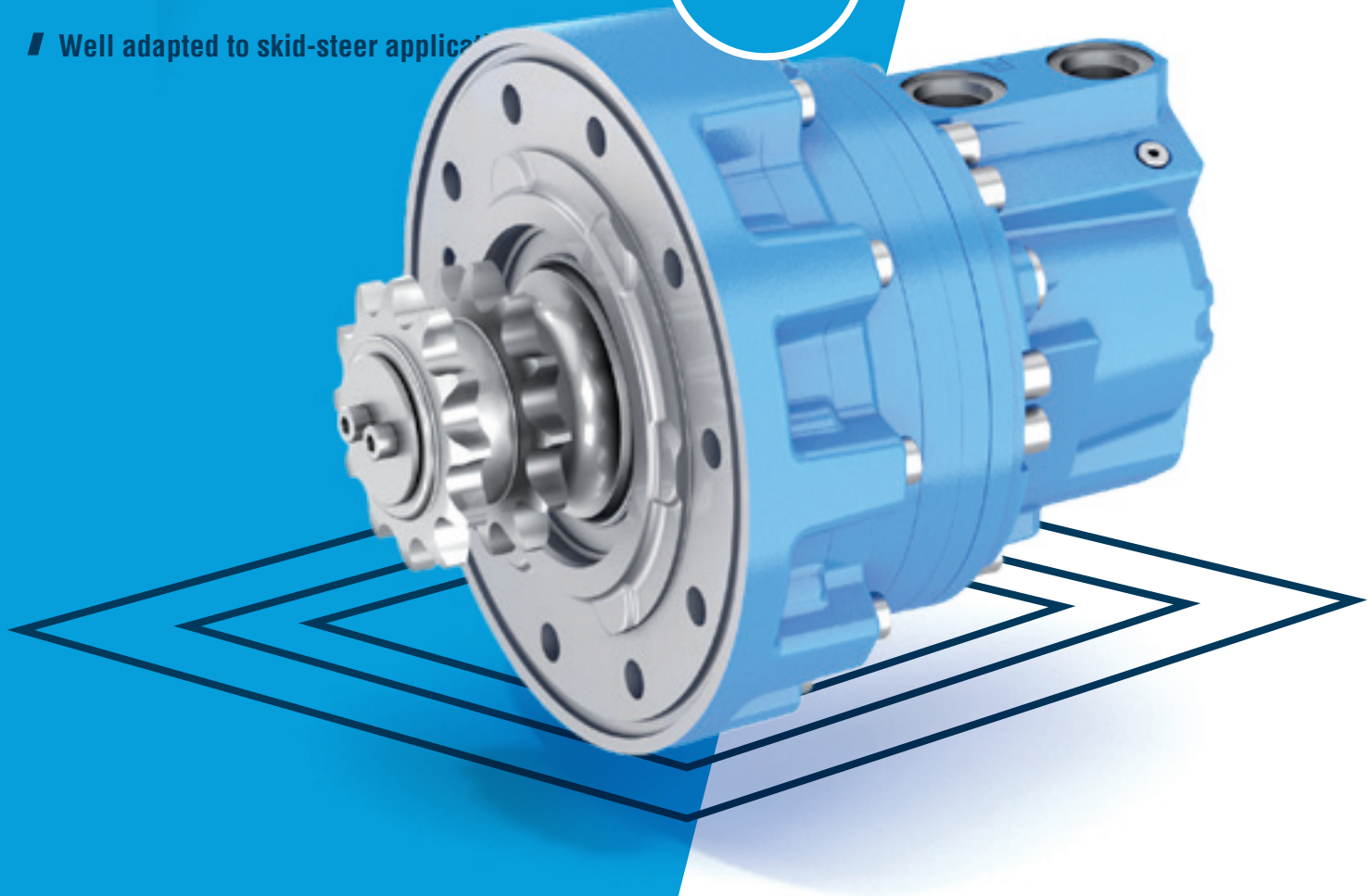
More information > Page 26

# SKID-STEER MOTOR

## COMPACT SIZE FOR A CUSTOM FIT

- Compact motors
- Smooth speed shifting
- Integrated exchange valve
- Single or dual displacement
- Integrated brake
- Well adapted to skid-steer applica

NEW!



# ML / MLE

## ML04 ▪ ML/MLE06

- From 174 to 842 cm³/rev. [10.6 to 51.4 cu.in/rev.]
- Up to 5 106 N.m [3,766 lbf.ft]
- Up to 450 bar [6,527 PSI]
- Up to 483 rpm
- Up to 30 kW [40 HP]

## Performance

| | | First displacement* | | | | Second displacement** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
| **ML04** | 450 [6,527] | 261 - 447 [15.9] - [27.3] | 3 201 [2,361] | 326 | 25 [33] | 174 - 298 [10.6] - [18.2] | 2 134 [1,574] | 483 | 20 [27] |
| **ML06** | 381 [5,526] | 630 [38.4] | 3 820 [2,817] | 226 | 30 [40] | 420 [25.6] | 2 547 [1,875] | 330 | 20 [27] |
| **MLE06** | 381 [5,526] | 702 - 842 [42.8] - [51.4] | 5 106 [3,766] | 203 | 30 [40] | 421 - 561 [25.7] - [34.2] | 3 402 [2,509] | 322 | 20 [27] |

*Available for single or dual displacement motors
**Only available for dual displacement motors
***Max. theoretical torque (N.m) : 1/(20 π) x max. displacement (cm³/rev.) x max. pressure (bar)

## Dimensions

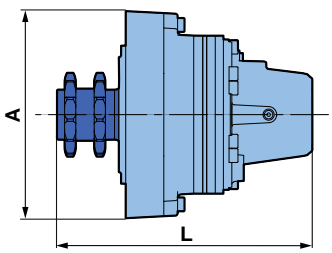
**1C : One displacement**
**2C : Dual displacement**

| | | | ML04 | ML06 MLE06 |
|---|---|---|---|---|
| **L** | 1C | mm [in] | 336 [13.2] | 330 [13.00] |
| | 2C | mm [in] | 336 [13.2] | 340 [13.40] |
| **A dia. max.** | | mm [in] | 272 [10.7] | 236 [9.29] |
| **Weight max.*** | | kg [lb] | 48.3 [106.5] | 49 [108] |

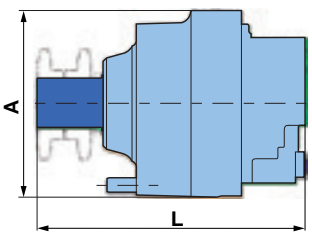
*Two displacements motor

The ML motors are designed for a skid-steer's small engine compartment.
While other motors require offset layout, these compact powerhouses can be mounted back-to back, allowing for symmetric vehicle design, increased parts commonality, and easier access or vehicle maintenance.

ML04




ML06




# MORE COMFORT AND PRODUCTIVITY

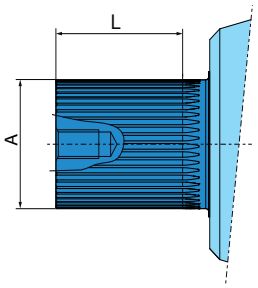
## Softshift design and integrated exchange valve

The ML06 incorporates the patented SoftShift™ two-speed design that softens the shifting of the transmission, providing smoother operation and greater operator comfort.

Additionally, an integrated exchange valve sends hot oil to the cooler while providing trouble-free cold weather performance excellent for use in snow removal applications. The unique features of the ML06 motor provide greater overall productivity to skid-steer loader operation.

## Splined shaft types

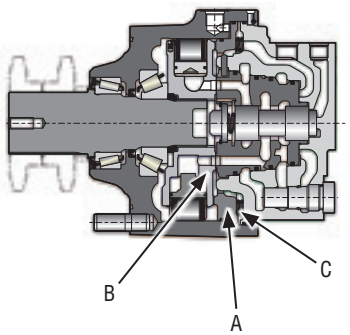
| | | ML06<br>MLE06 | |
|---|---|---|---|
| **Number of teeth** | | 53 | 49 |
| **Standard** | | ANSI B92.1-1996 | ANSI B92.1-1996 |
| **Accuracy class** | | 5 | 5 |
| **Module** | | 20/40 | 20/40 |
| **Pressure angle** | | 30° | 30° |
| **L** | mm [in] | 67,8 [2.67] | 67,8 [2.67] |
| **A dia. max.** | mm [in] | 68,58 [2.70] | 63,5 [2.50] |




## Integrated claw brake

### Max. parking braking torque

| N.m [lb.ft] | ML04 | ML06 |
|---|---|---|
| 3 000 [2,213] | ● | |
| 4 500 [3,319] | | ● |




This parking brake consists of two parts, one non rotating (A)acting as brake piston, one rotating (B) part of the cylinder block, each equiped with a row of teeth. In the absence of debraking pressure, the (C) spring maintains part A in contact with the cylinder-block, thus immobilizing it.

# MS MOTORS

## For small and big skid-steers

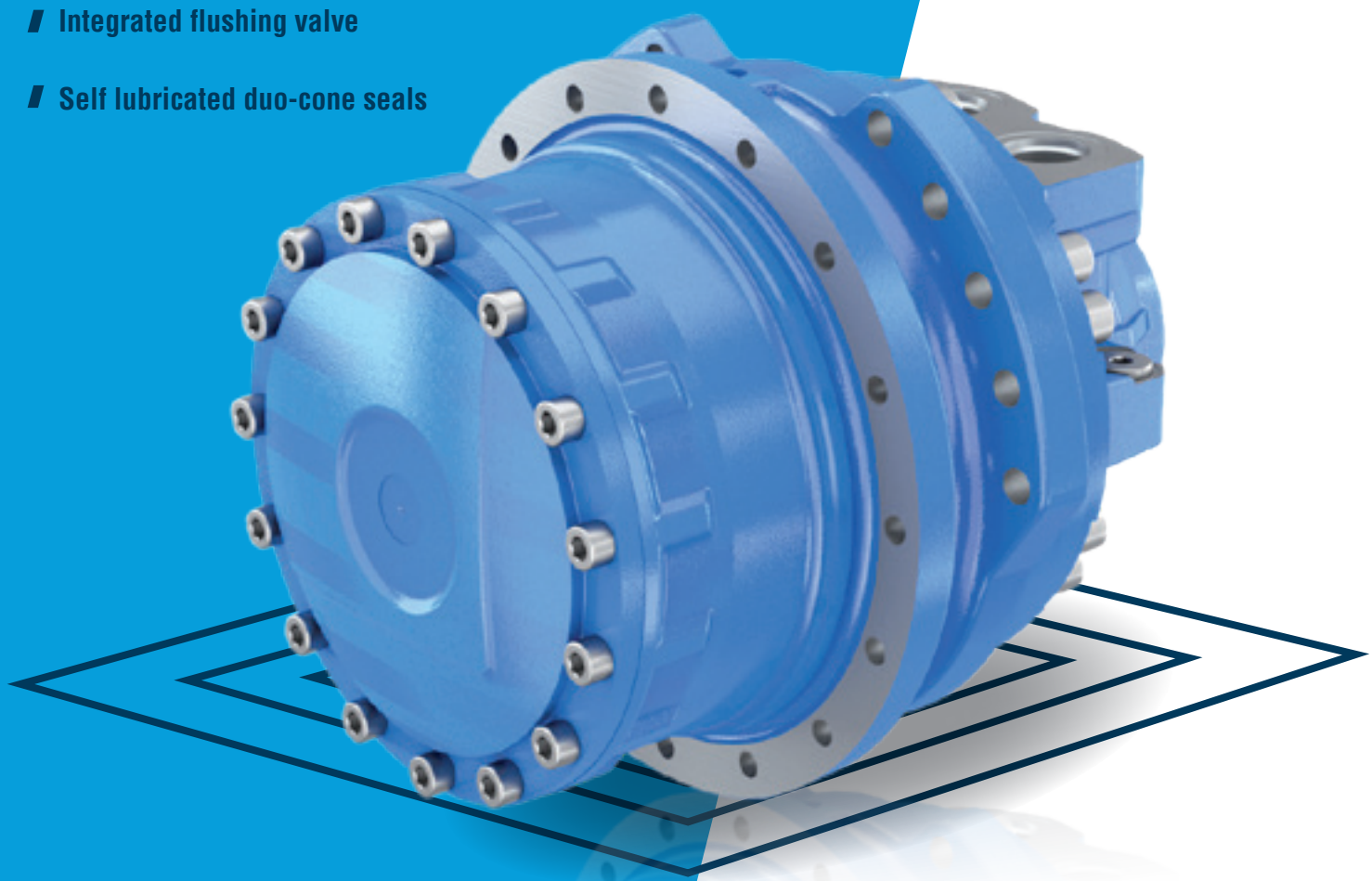
Poclain Hydraulics motors are designed to power skid-loaders of 600 kg [1,323 lb] to 1 800 kg [4,000 lb] SAE rated lift capacity.
The ML06 is best applied to loaders ranging betwen 800 kg [1,764 lb] and 1 250 kg [2,756 lb] capacity.

| | Displacement range cm³/rev [cu.in/rev] | Max. Torque N.m [lbf.ft] | Skid-loader SAE rated lift capacity kg [lb] |
|---|---|---|---|
| **MS02** | 172 to 255 [10.5 to 15.6] | 1 800 [1,227] | 600 to 800 [1,323 to 1,764] |
| **MSE02** | 332 to 398 [20.2 to 24.3] | 2 500 [1,843] | |
| **MS05** | 260 to 560 [15.9 to 34.2] | 4 000 [2,950] | 800 to 1 650 [1,764 to 3,600] |
| **MSE05** | 503 to 750 [30.7 to 45.7] | 4 770 [3,518] | |

More information > Page 26

# TRACK DRIVE
## COMPACT SIZE FOR A CUSTOM FIT

- Compact motor
- Balanced and flexible design
- Easy integration
- High brake torque capacity
- Integrated flushing valve
- Self lubricated duo-cone seals



# MT

## MT07

- From 329 to 920 cm³/rev. [20.1 to 56.1 cu.in/rev.]
- Up to 6 000 N.m [4,425 lbf.ft]
- Up to 450 bar [6,526 PSI]
- Up to 270 rpm
- Up to 41 kW [55 HP]



## Performance

| | | First displacement* | | | | Second displacement** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] | Displacement range cm³/rev [cu.in/rev] | Max. Torque*** N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
| **MT07** | 450 [6,526] | 495-915 [30.2-55.8] | 6 000 [4,425] | 270 | 41 [55] | 329-610 [20.1-37.28] | 4 370 [3,223] | 270 | 32 [43] |

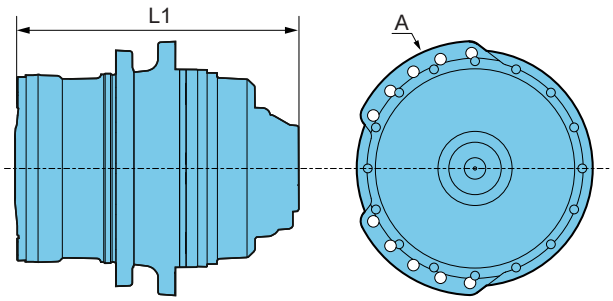
*Available for single or dual displacement motors
**Only available for dual displacement motors
***Max. theoretical torque (N.m) : 1/(20 π) x max. displacement (cm³/rev.) x max. pressure (bar)

## Dimensions

**1C : One displacement**
**2C : Dual displacement**

| | | | MT07 |
|---|---|---|---|
| **L** | 1C | mm [in] | 312,4 [12.3] |
| | 2C | mm [in] | 343,9 [13.5] |
| **A dia. max.** | | mm [in] | 308 [12.1] |
| **Weight max.*** | | kg [lb] | 71,3 [157.2] |

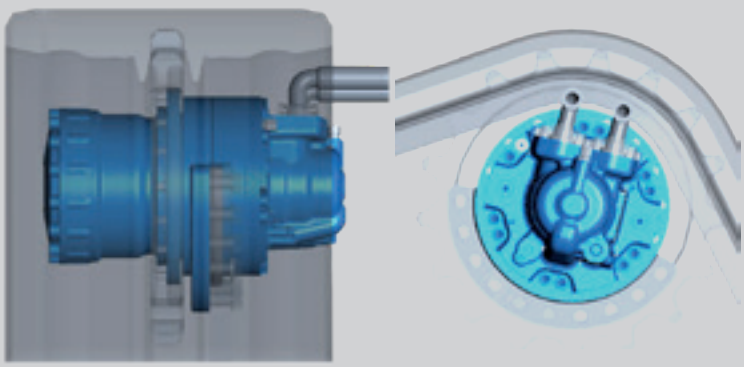
*Two displacements motor



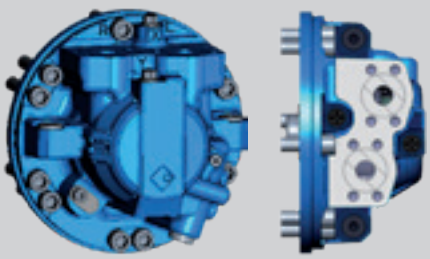

## EASE INTEGRATION

### Balanced and flexible design

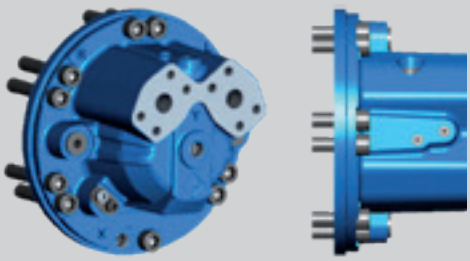
- Easily fits inside track
- Compatible with 320 mm [13 in.] track



### Radial ports cover



### Axial ports cover

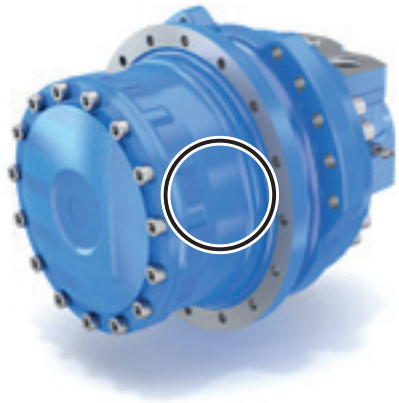


## Brake

### Multidisc parking brake mounted in the bearing support

- Negative brake
- Up to 6 100 N.m [4,499 lb.ft]

- Integrated parking brake
- Designed to withstand emergency braking
- Multi-discs brake located in motor case
- Low number of seals



## DESIGN TO LAST

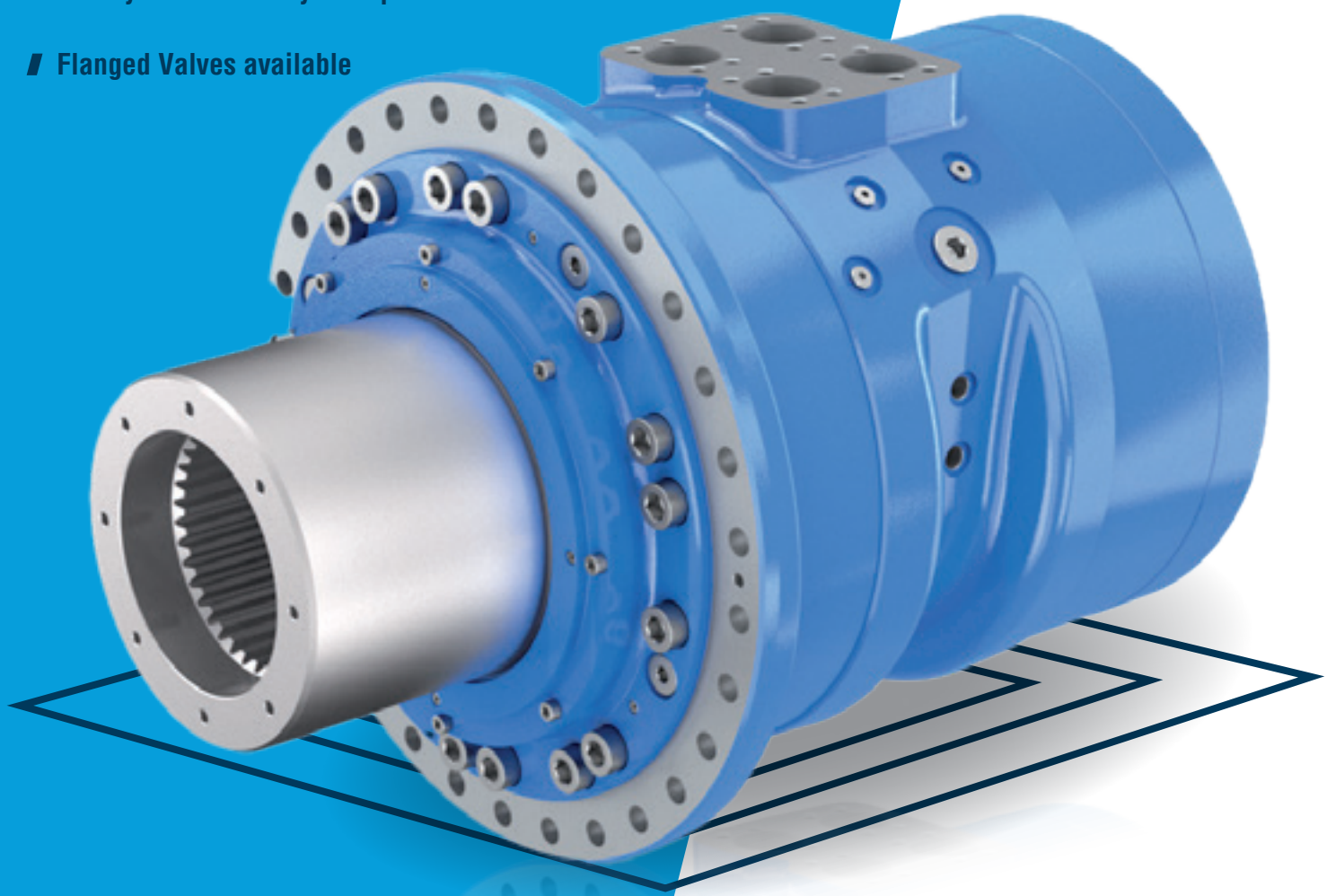
### Increase machine durability

- High load capacity bearing to withstand extreme shock loads (110 kN.m radial peak).
- Unique patented sealing system to withstand harsh environment.
- Integrated flushing valve for motor cooling to reduce heat generation and handle heavy duty cycle.
- No maintenance required thanks to self lubricated duo-cone seal.

Integrated flushing valve

# INDUSTRIAL
## PERFORMANCE AND LOW CONSUMPTION

- High Output Torque
- High Power Density
- Compactness
- Steady motion at very low speed
- Flanged Valves available



# MI

## MI88 ▪ MI250 ▪ MI330

| |
|---|
| From 7 000 to 40 000 cm³/rev. [426.9 to 2,441 cu.in/rev.] |
| Up to 200 000 N.m [147,512 lbf.ft] |
| Up to 450 bar [6,527 PSI] |
| Up to 140 rpm |
| Up to 600 kW [804 HP] |



## Performance

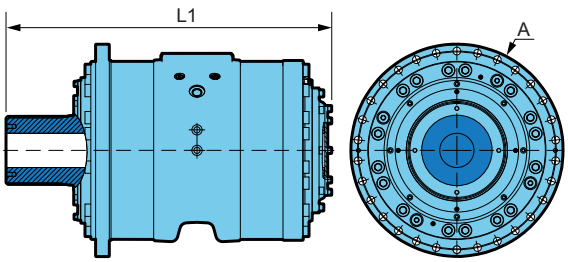
| | Max. Pressure bar [PSI] | Displacement range $cm^3$/rev [cu.in/rev] | Max. Torque* N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
|---|---|---|---|---|---|
| **MI88** | 450 [6,527] | 7 000 - 10 400 [426.9 - 634.3] | 74 484 [54,936] | 140 | 265 [355] |
| **MI250** | 450 [6,527] | 17 500 - 30 000 [1,037 - 1,831] | 167 112 [123,255] | 100 | 500 [671] |
| **MI330** | 450 [6,527] | 26 700 - 40 000 [1,629 - 2,441] | 200 000 [147,512] | 130 | 600 [804] |

*Max. theoretical torque (N.m) : 1/(20 π) x max. displacement ($cm^3$/rev.) x max. pressure (bar)

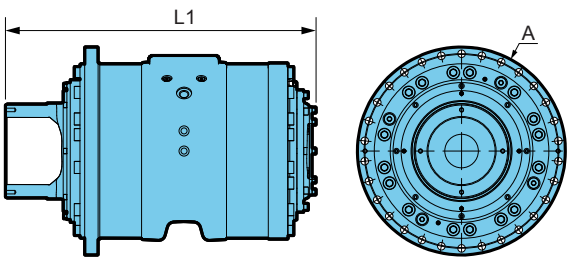
## Dimensions

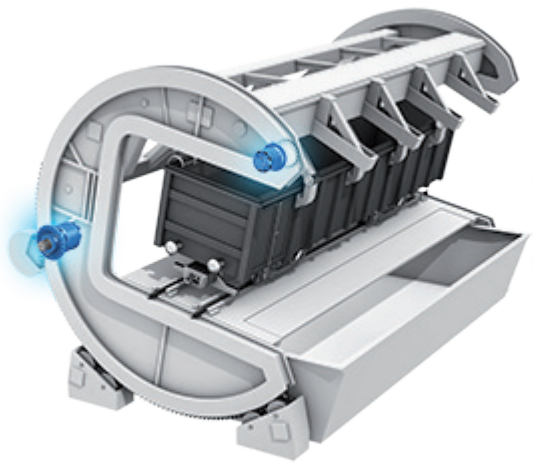
| | | MI88 | MI250 | | MI330 | |
|---|---|---|---|---|---|---|
| | | (splined) | (splined) | (shrink disc) | (splined) | (shrink disc) |
| **L1** | mm [in] | 631,5 [24.87] | 950,8 [37.43] | 925,3 [36.43] | 1 014 [39.92] | 957 [37.67] |
| **A dia. max.** | mm [in] | 500 [19.68] | 631 [24.84] | 631 [24.84] | 631 [24.84] | 631 [24.84] |
| **Weight max.** | kg [lb] | 352 [776] | 920 [2,028] | 940 [2,070] | 976 [2,152] | 964 [2,125] |

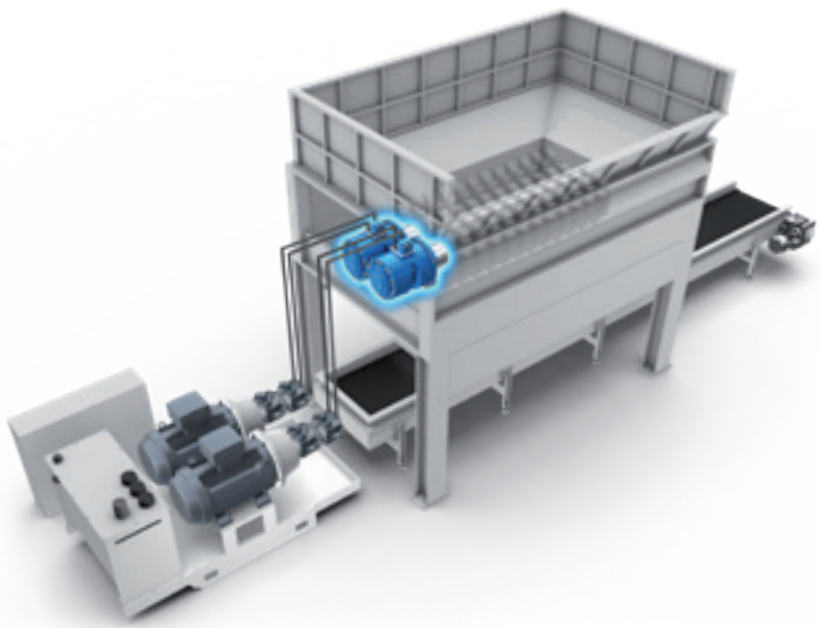
Male splined shaft motor




Shrink disc motor





## Shaft types

| | | Female splines | | Male splines | | Shrink disc | | Hollow shaft |
|---|---|---|---|---|---|---|---|---|
| | | MI250 | MI330 | MI88 | MI250 | MI250 | MI330 | MI250 |
| **Norm** | | DIN 5480 | DIN 5480 | DIN 5480 | DIN 5480 | - | - | - |
| **Module** | | 5 | 5 | 5 | 5 | - | - | - |
| **Number of teeth** | | 38 | 50 | 31 | 38 | - | - | - |
| **Nominal diameter** | mm<br>[in] | 200<br>[7.87] | 260<br>[10.23] | 165<br>[6.50] | 190<br>[7.48] | -<br>- | -<br>- | 100<br>[3.94] |
| **External diameter** | mm<br>[in] | -<br>- | -<br>- | 169<br>[6.65] | 200<br>[7.87] | 280<br>[11.00] | 319<br>[12.56] | -<br>- |
| **Internal diameter** | mm<br>[in] | -<br>- | -<br>- | -<br>- | -<br>- | 200<br>[7.87] | 260<br>[10.23] | -<br>- |

Female splined shaft with circular fixation

Shaft for shrink disc with circular fixation

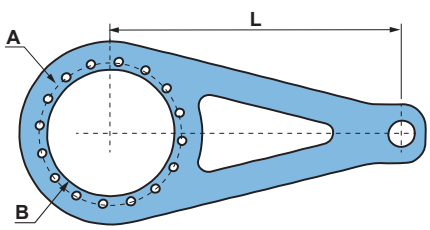
Female splined shaft with lugs fixation

Male splined shaft with circular fixation

Hollow shaft

## Torque arms and shrink discs

To ease the integration of our motors into your machines, Poclain Hydraulics can supply motors with adapted torque arms and shrink discs.



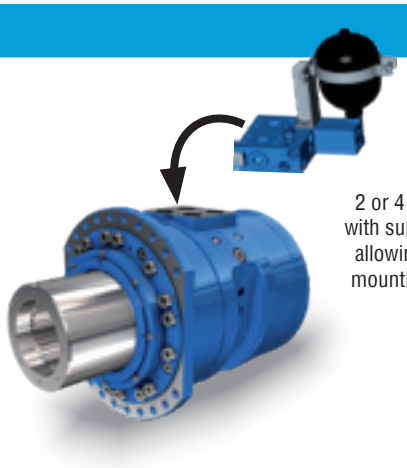

MI250 motor with torque arm

| | L min.<br>mm [in] | A dia.<br>mm [in] | B dia.<br>mm [in] | Mounting | Thickness<br>mm [in] |
|---|---|---|---|---|---|
| **MI88** | 800<br>[31.5] | 450<br>[17.72] | 375<br>[14.76] | 16 x M24 | 40<br>[1.57] |
| **MI250** | 1 250<br>[49.21] | 580<br>[22.83] | 520<br>[20.47] | 30 x M20 | 40<br>[1.57] |
| **MI330** | 1 500<br>[59.05] | 580<br>[22.83] | 520<br>[20.47] | 32 x M24 | 40<br>[1.57] |

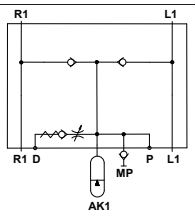
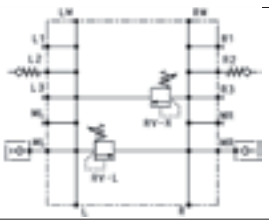
MI250 motor with shrink discs

## Protection valve for MI250 and MI330

CORAC valve, which is directly flanged on the industrial motor (MS83, MS125, MI250, MI330, MHP), will offer enhanced protection of the motor against possible cavitation during operation, by ensuring sufficient back pressure in the motor (additional flow provided by the accumulator).
This valve is available with two positions for the accumulator (0° or 90°).



2 or 4 DN38 ports with support surface allowing for direct mounting of valves

| | Max. operating pressure | Precharge pressure | Volume | Hydraulic schematics | |
|---|---|---|---|---|---|
| | bar [PSI] | bar [PSI] | L [G] | Anti-cavitation | Cross-over relief |
| **Valve** | 420 [6,091] | - | - |  |  |
| **Accumulator** | 48 [696] | 12 [174] | 2 [0.53] | | |



# MS AND MHP HYDRAULIC MOTORS

## A full range of large displacement motors

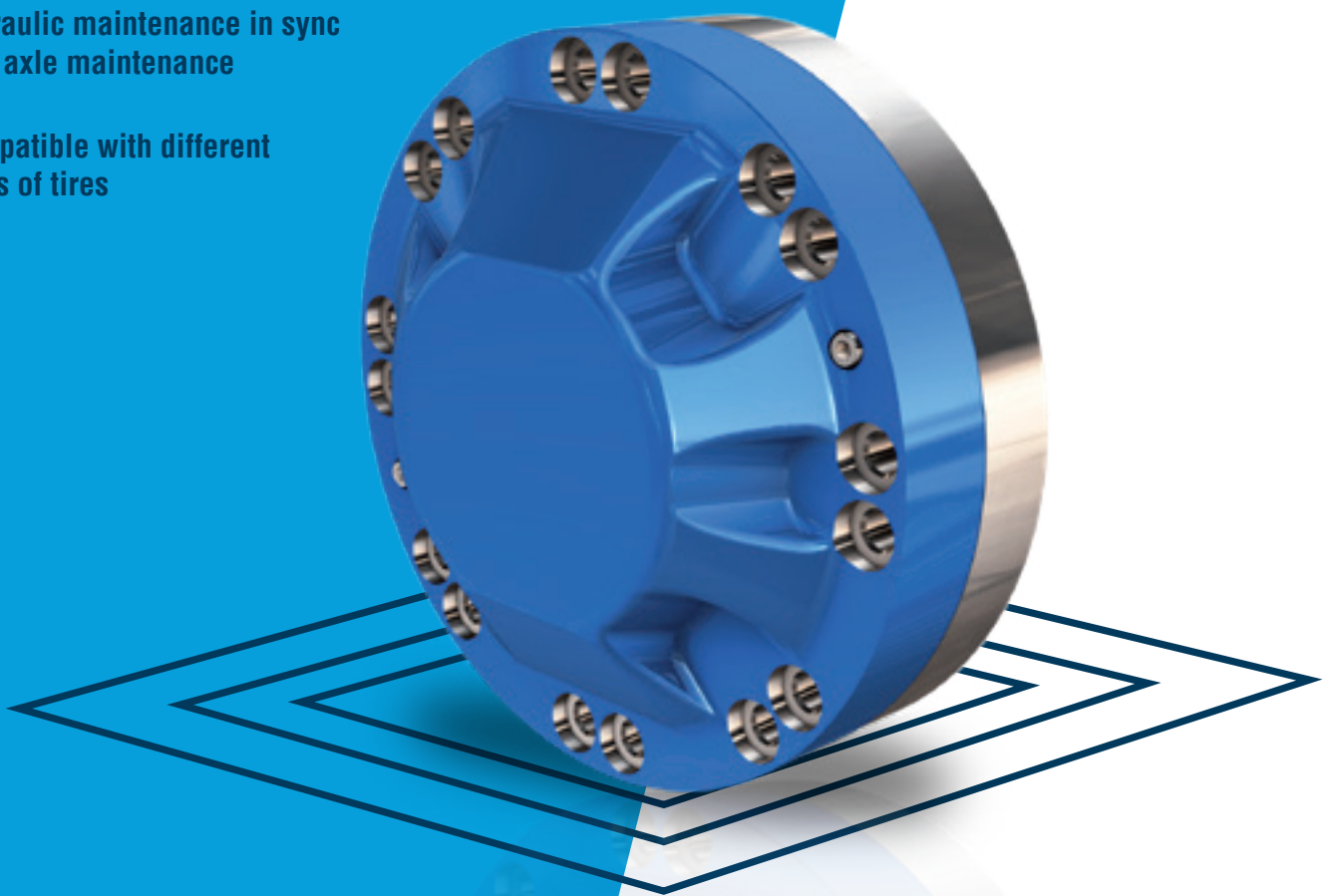
To complete the MI range motors, Poclain Hydraulics offers a complete range of large size hydraulic motors with all the benefits of radial piston technology (high torque, efficiency, easy control, robustness,…) and a displacement of up to 15 liters.

| | Max. Pressure bar [PSI] | Displacement range cm³/rev [cu.in/rev] | Max. Torque N.m [lbf.ft] | Max. Speed RPM | Max. Power kW [HP] |
|---|---|---|---|---|---|
| **MHP20 to MHP27** | 500 [7,252] | 473 to 3 526 [28.9 to 215.2] | 28 059 [20,695] | 548 | 280 [375] |
| **MS50 to MS125** | 450 [6,527] | 3 500 to 15 000 [213.5 to 915] | 77 000 [56,792] | 200 | 240 [322] |

More information MHP motors > Page 14
More information MS motors > Page 24

# HYDROBASE FOR WHEEL HUBS
## TO PROVIDE ADDITIONAL TRACTION OR RETAINING TORQUE

- Compatible with the original braking system (drum or disk)
- Does not affect kinematic steering or suspension
- No need to re-certify the axle
- Watertight design
- Hydraulic maintenance in sync with axle maintenance
- Compatible with different types of tires



# MF / MFE

## MF/MFE08

| |
|---|
| From 627 to 1 248 $cm^3$/rev. [38.2 to 76.1 cu.in/rev.] |
| Up to 7 945 N.m [5,860 lbf.ft] |
| Up to 450 bar [6,530 PSI] |
| Up to 150 rpm (1000 rpm in freewheeling) |
| Up to 41 kW [55 HP] |

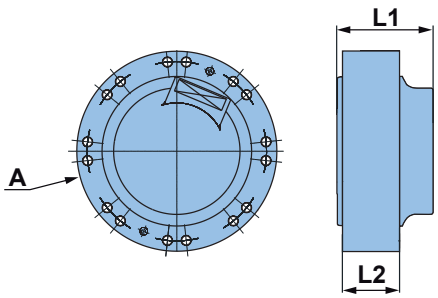
## Performance

| | Max. Pressure bar [PSI] | Displacement range $cm^3$/rev [cu.in/rev] | Max. Torque* N.m [lbf.ft] | Max. Speed RPM | Max. Speed freewheeling RPM | Max. Power kW [HP] |
|---|---|---|---|---|---|---|
| **MF08** | 450 [6526] | 627 - 934 [38.2] - [57.0] | 6 689 [4,934] | 150 | 1 000 | 41 [55] |
| **MFE08** | 400 [5800] | 838 - 1 248 [51.1] - [76.1] | 7 945 [5,860] | 112 | 1 000 | 41 [55] |

*Max. theoretical torque (N.m) : 1/(20 π) x max. displacement ($cm^3$/rev.) x max. pressure (bar)

## Dimensions

| | | MF08-MFE08 |
|---|---|---|
| **L1** | mm [in] | 123,2 [4.85] |
| **L2** | mm [in] | 73 [2,87] |
| **A dia.** | mm [in] | 257 [10.12] |
| **Weight** | kg [lb] | 29 [1.14] |




## Optional features

### Temperature control

| | MF08-E08 |
|---|---|
| **High efficiency (zero clearance pistons/ring)** | ● |
| **Mechanical freewheeling** | ● |

### Reinforcement

| | MF08-E08 |
|---|---|
| **Extra long life (Diamond™)** | ● |

# ALL-WHEEL DRIVE FOR TRUCK

## Simple design that is easy to install

Customers have no other choice, but to opt for mechanical allwheel drive to improve the mobility of their trucks. This generates constraints and impacts their total cost of ownership, which results in:

- increased fuel consumption;
- reduction in payload capacity;
- lower levels of comfort for the driver.

Addidrive enables customers to seize new market opportunities.
OEM's are provided with a proven technology which meets their strategic needs.

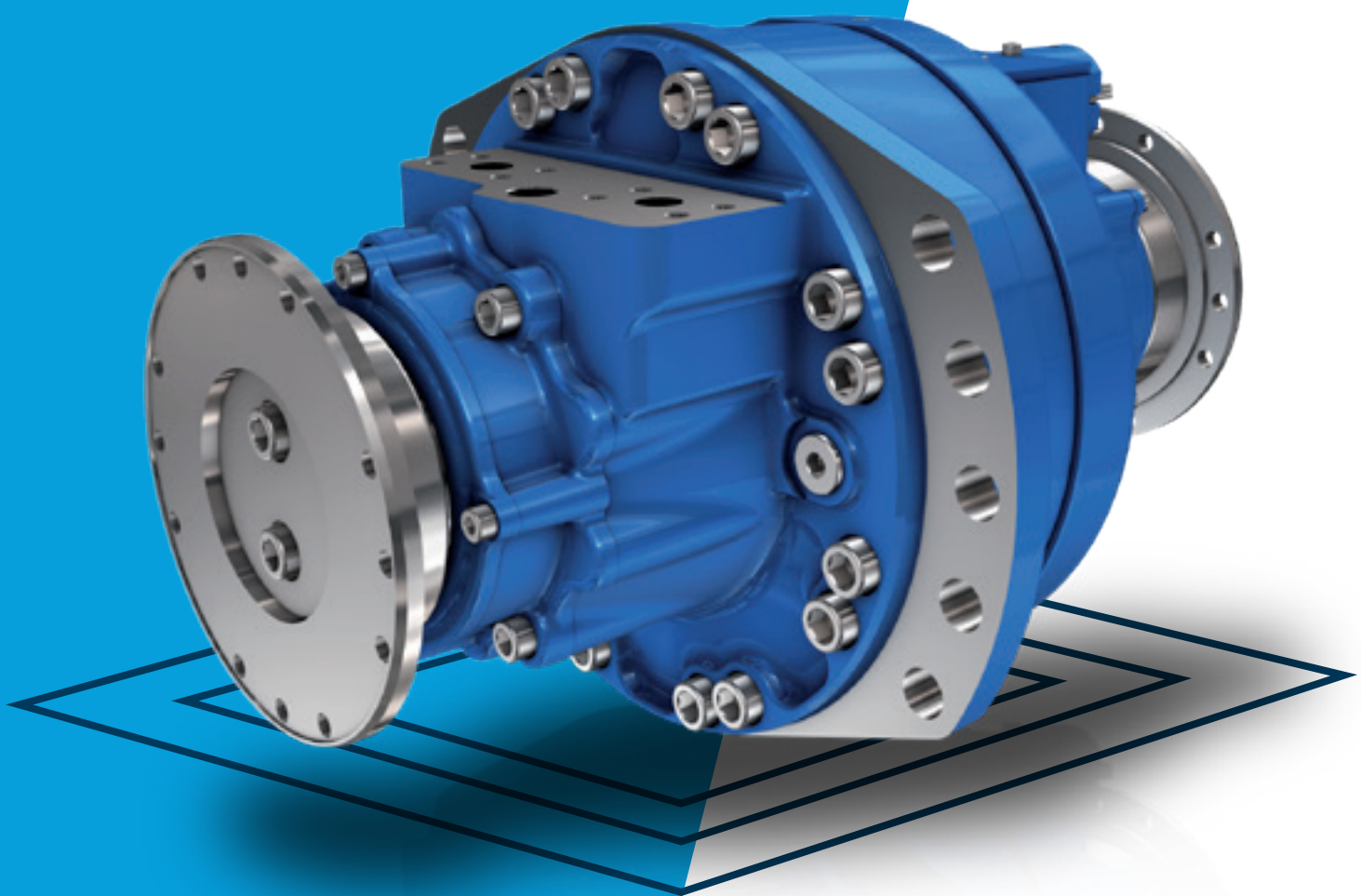
A genuine alternative to mechanical all-wheel drive, Addidrive ensures optimum mobility for trucks that need to work in harsh weather conditions and irregular terrain - such as fields, forests and construction sites.

ADDIDRIVE TECHNOLOGY

More information > Page 138

# *CREEPDRIVE*
## TO WORK AT LOW AND CONSTANT SPEED

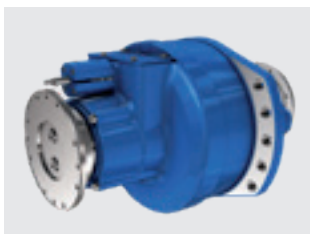
- Single or dual displacement
- Integrated clutch
- Watertight design
- Compact



# CDM

## CDM10 ▪ CDM20

- From 728 to 2 424 $cm^3$/rev. [44.4 to 148.1 cu.in/rev.]
- Up to 15 580 N.m [11,491 lbf.ft]
- Up to 450 bar [6,527 PSI]
- Up to 389 rpm (3,700 rpm in freewheeling)
- Up to 175 kW [234.7 HP]



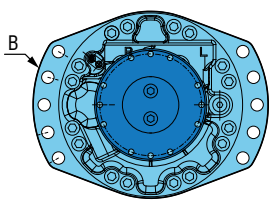
## Performance

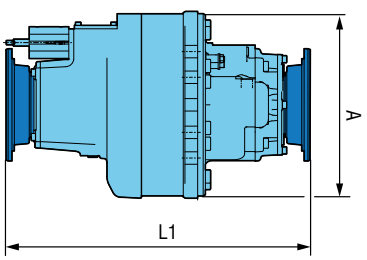
| | Max. Pressure bar [PSI] | Displacement range First displacement cm³/rev [cu.in/rev] | Displacement range Second displacement cm³/rev [cu.in/rev] | Max. Torque output N.m [lbf.ft] | Max. speed CreepDrive mode RPM | Max. speed Freewheeling mode RPM | Max. Power kW [HP] |
|---|---|---|---|---|---|---|---|
| **CDM10** | 450 [6,527] | 728 - 1 352 [44.4] - [82.5] | - - | 8 680 [6,401] | 389 | 3 700 | 95 [127.4] |
| **CDM20** | 450 [6,527] | 1 416 - 2 427 [86.4] - [148.1] | 708 - 1 214 [43.2] - [74.1] | 15 580 [11,491] | 363 | 3 700 | 175 [234.7] |

## Dimensions

| | | CDM10 | CDM20 |
|---|---|---|---|
| | | Companion flange | Companion flange |
| **L1** | mm [in] | 497 [19.56] | 550 [21.65] |
| **A dia. max.** | mm [in] | 329 [12.95] | 329 [13.00] |
| **B dia. max.** | mm [in] | 425 [16.73] | 425 [16.73] |
| **Weight max.** | kg [lb] | 130 [287] | 160 [353] |

CDM 10 and CDM20 with companion flange




## Shaft types

| | Companion flange | | | | | |
|---|---|---|---|---|---|---|
| | SAE 1650 | SAE 1710 | SAE 1810 | XS 150 | XS 180 | XS 200 |
| **CDM10** | ● | ● | ● | ● | ● | - |
| **CDM20** | - | ● | ● | ● | ● | ● |

# CREEPDRIVE SOLUTION

## Consistent low speed drive

CreepDrive is a hybrid mechanical-hydraulic transmission for vehicles that travel at normal speed and work at low speed.
The system allows vehicles to work at very low constant speed regardless of the engine speed, allowing auxiliary systems to take the power they need to perform work effectively.
When the system is disengaged, the vehicle is able to drive at normal on-road speed with no additional losses.

- Can be integrated in all trucks from 12t up to 44t for multiple applications
- Compatible with diesel, gasoline and LNG
- Compatible with automatic and manual gearbox
- Fitted on trucks with or without CAN Bus

## Benefits

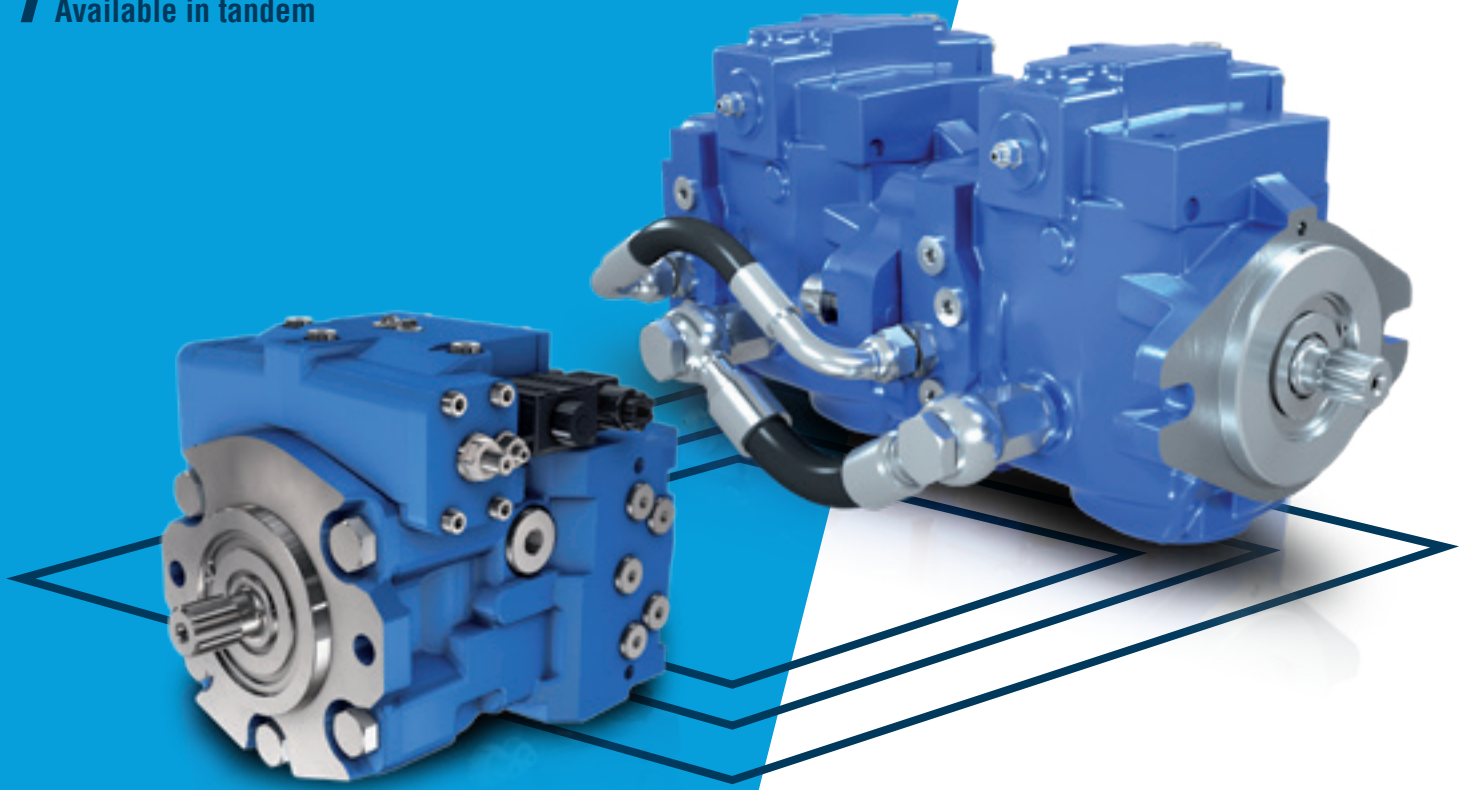
- Ability to work at constant speed from 0.4 kph to 12 kph [0.25 mph to 7.5 mph] in both forward and reverse
- Independent of engine speed
- Compatible with low engine rpm enabling low noise level
- Easy to install and mount on the chassis
- Does not affect the original truck kinematics
- No impact on chassis stiffness, the original chassis flexibility is guaranteed
- Reduces wear on the brake, clutch and transmission
- No need for specific maintenance: CreepDrive maintenance is done simultaneously with mechanical transmission's maintenances

More information > Page 140

# PUMPS

# MEDIUM DUTY PUMPS
## DESIGN FOR PERFORMANCE AND EASY INTEGRATION

- Axial piston technology
- Variable displacement
- Compact design
- A large choice of controls
- Available in tandem



# PM

## PMV0 ▪ PM10 ▪ PM20
## PM30 ▪ PM50

- From 7 to 52 cm³/rev. [0.43 to 3.17 cu.in/rev.]
- Up to 82,8 N.m [733 lbf.ft]
- Up to 420 bar [6,091 PSI]
- Up to 3 600 rpm
- Up to 99,8 kW [133.8 HP]

## Performance

| | | PMV0 | PM10 | PM20 | PM30 | PM50 |
|---|---|---|---|---|---|---|
| **Displacement range** | $cm^3$/rev [cu.in/rev] | 7 - 18 [0.43] - [1.09] | 7 - 21 [0.43] - [1.24] | 21 - 27.4 [1.28] - [1.67] | 25 - 34,2 [1.53] - [2.09] | 40 - 52 [2.44] - [3.17] |
| **Rated Speed** | RPM | 3 600 | 3 600 | 3 600 | 3 600 | 3 600 |
| **Max. Pressure** | (Continuous) bar [PSI] | 210 [3,045] | 210 [3,045] | 250 [3,625] | 300 [4,350] | 300 [4,350] |
| | (Intermittent) bar [PSI] | 300 [4,351] | 350 [5,076] | 370 [5,366] | 420 [6,091] | 400 [5,801] |
| **Max. theorical absorbed power** | kW [HP] | 12,7 - 30,5 [17.0] - [40.9] | 14,9 - 42,6 [20.0] - [57.1] | 32,6 - 44,4 [43.7] - [59.5] | 48,0 - 65,6 [64.0] - [88.0] | 76,8 - 99,8 [103] - [134] |

## Mounting flanges and shafts

| | | | PMV0 | PM10 | PM20 | PM30 | PM50 |
|---|---|---|---|---|---|---|---|
| **Flange SAE A** | **Splined shaft** | **9 teeth, pitch 16/32** | ● | ● | | | |
| | | **11 teeth, pitch 16/32** | ● | ● | | | |
| | **Key shaft mm [in]** | **Diameter 15,875 [0.624]** | ● | | | | |
| | | **Diameter 18 [0.71]** | ● | | | | |
| | | **Diameter 19 [0.75]** | | ● | | | |
| **Flange SAE B** | **Splined shaft** | **11 teeth, pitch 16/32** | | ● | | | |
| | | **13 teeth, pitch 16/32** | | ● | ● | ● | ● |
| | | **14 teeth, pitch 16/32** | | | | | ● |
| | | **15 teeth, pitch 16/32** | | | ● | | |
| | **Key shaft mm [in]** | **Diameter 19 [0.75]** | | ● | | | |
| | | **Diameter 25,38 [0.99]** | | | | | ● |
| **Flange SAE BB** | **Splined shaft** | **15 teeth, pitch 16/32** | | | ● | ● | ● |

## Auxiliary mounting pads

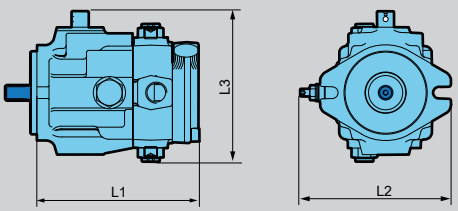
| | | PMV0 | PM10 | PM20 | PM30 | PM50 |
|---|---|---|---|---|---|---|
| **German group 1** | | ● | ● | | | |
| **German group 2** | | ● | ● | | | |
| **Flange SAE A** | **9 teeth coupling** | | ● | ● | ● | ● |
| | **11 teeth coupling** | | ● | | ● | ● |
| **Flange SAE B** | **13 teeth coupling** | | | | ● | ● |
| **Flange SAE BB** | **15 teeth coupling** | | | | ● | ● |
| **No auxiliary mounting pad** | | ● | ● | ● | ● | ● |
| **Tandem fitting** | | ● | | ● | | |
| **Tandem without charge pump** | | | | | ● | ● |

## Dimensions

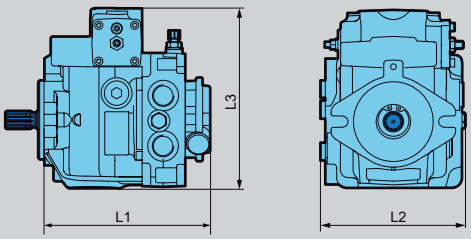
| | | PMV0 | PM10 | PM20 | PM30 | PM50 |
|---|---|---|---|---|---|---|
| **L1** | mm<br>[in] | 161,3<br>[6.35] | 173<br>[6.81] | 197<br>[7.76] | 212,5<br>[8.37] | 230,5<br>[9.07] |
| **L2** | mm<br>[in] | 152<br>[5.98] | 144<br>[5.67] | 174<br>[6.85] | 221,7<br>[8,72] | 218<br>[8.58] |
| **L3** | mm<br>[in] | 142,5<br>[5.61] | 187,7<br>[7.39] | 207,2<br>[8.16] | 212,2<br>[8.35] | 214,5<br>[8.45] |
| **Weight max.*** | kg<br>[lb] | 9,5<br>[20.9] | 18,8<br>[41.4] | 23<br>[50.7] | 29<br>[63.9] | 32<br>[70.5] |

*Depending on the controls and the options.

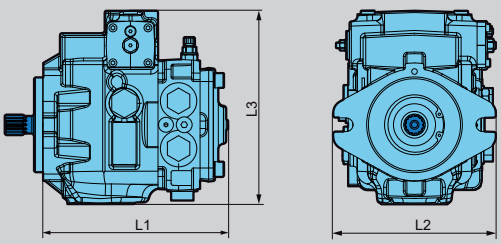
PMV0
with direct mechanical control and without auxiliary mounting pad



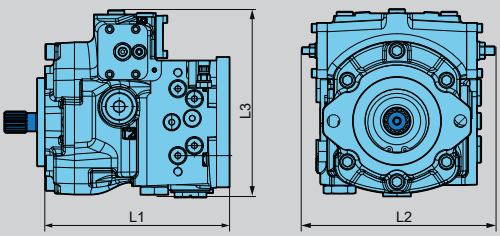

PM10
with hydraulic servo control and without auxiliary mounting pad



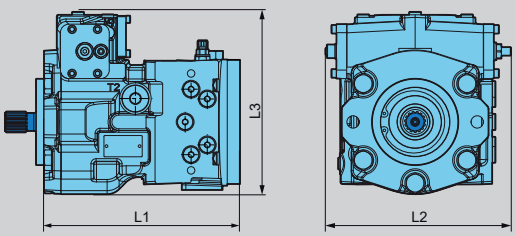

PM20
with hydraulic servo control and without auxiliary mounting pad




PM30
with hydraulic servo control and without auxiliary mounting pad

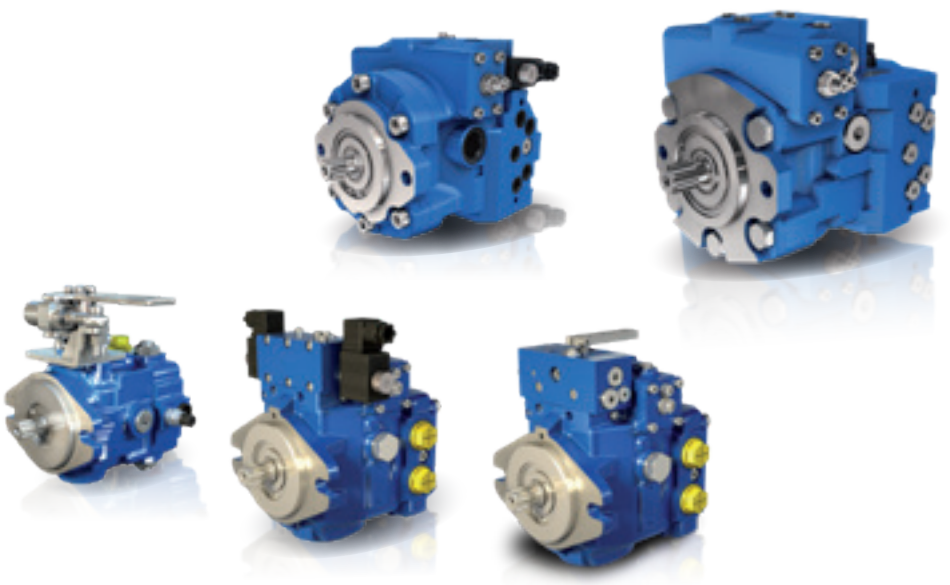



PM50
with hydraulic servo control and without mounting pad



## Controls

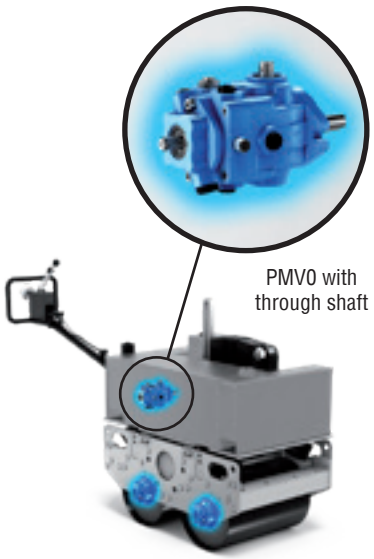
| | PMV0 | PM10 | PM20 | PM30 | PM50 |
|---|---|---|---|---|---|
| Direct mechanical (M) | ● | ● | | | |
| Direct mechanical with return spring (N) | ● | ● | | | |
| Direct mechanical with return spring and zero position setting (L) | ● | | | | |
| Mechanical servo control with feed-back (A) | | ● | ● | ● | ● |
| Hydraulic servo control (S) | ● | ● | ● | ● | ● |
| Hydraulic servo control with feed-back (T) | | ● | | ● | ● |
| Hydraulic Automotive Control (D) | | ● | ● | ● | ● |
| Electrical on-off servo control with return spring without electrovalve (B) | | ● | | ● | ● |
| Electrical on-off servo control with electrovalve (C12/C24) | | ● | | | |
| Electrical on-off servo control with return spring and electrovalve (B12/B24) | | ● | | ● | ● |
| Electro-proportional servo control (P) | | ● | ● | ● | ● |
| Electro-proportional servo control with feed-back (Q) | | ● | ● | ● | ● |



## Additional features

Please take in consideration that all combinations are not possible.

| | PMV0 | PM10 | PM20 | PM30 | PM50 |
|---|---|---|---|---|---|
| Electrical by-pass with brake engaged | ● | | | | |
| Screw by-pass in the cover (only for axial pump without charge pump) | ● | | | | |
| Lever by-pass | ● | | | | |
| Roller bearing | ● | ● | ● | ● | ● |
| Low noise valve plate | ● | | | | |
| Pressure filter | ● | ● | ● | ● | ● |
| Fluorinated elastomer seals | ● | ● | ● | ● | ● |
| Filter on suction line | ● | | | | |
| Filter on pressure line with/without clogging indicator | ● | ● | ● | ● | ● |
| External connections for filter | | ● | ● | ● | ● |
| SAE Flange Ports | | | | ● | ● |
| Mechanical Inching for control D | | ● | ● | ● | ● |
| Hydraulic inching for control D | | ● | ● | ● | ● |
| Neutral position switch (only with control A) | | ● | | ● | ● |
| Safety Valve | | ● | ● | ● | ● |
| UNF Threads ports | ● | ● | ● | ● | ● |
| Pressure gauge ports on relief valve | ● | ● | | | |
| Flushing valve | ● | ● | ● | ● | ● |
| Finishing coat | ● | ● | ● | ● | ● |
| Customized identification plate | ● | ● | ● | ● | ● |
| Speed sensor | | | | ● | ● |
| Antistall valve | | ● | ● | ● | ● |
| Pressure cut-off valve | | ● | | | |
| Brake inching | | | | ● | ● |
| Fitting for rear power take off | ● | | | | |
| Ball bearing (for D2 and S2 shafts) | ● | | | | |
| Supergerotor | ● | | | | |
| Twin ports | ● | | | | |


PMV0 with through shaft

# VALVES

# HYDRAULIC VALVES
## FOR OPEN AND CLOSED LOOP CIRCUITS

## DESIGNED FOR HYDROSTATIC TRANSMISSIONS AND TOOLS CONTROL

>p.86

- Steering Valves
- Traction Control Electronic Anti-Slipping Valves
- Traction Control Flow Dividers
- High Pressure Selector Valves
- Freewheeling Valves For On-Demand Hydrostatic Assist Drive
- Exchange Valves
- Hydrostatic Braking Valve For Electro-hydraulic Transmissions
- Serial Protection Valves
- Cross-Over Relief And Anti-Cavitation Valves
- Selector - Diverter Valves
- CETOP, Piloting And Modular Directional Control Valves
- Flow Divider
- Pressure Reducers

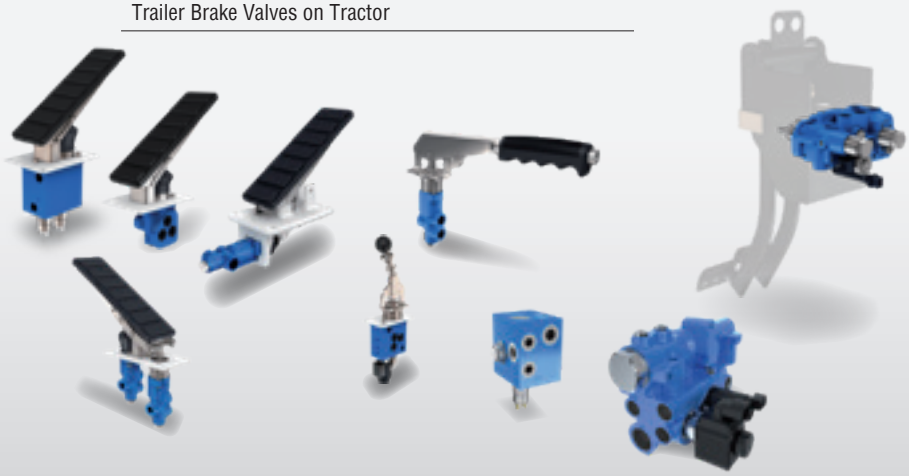
**MOTION CONTROL VALVES**

# VARIOUS BRAKING FUNCTIONS

**BRAKE VALVES**

- Emergency and Parking Brake Valves
- Service Brake Valves
- Accumulator Charging Valves
- Service Brake and Accumulator Charging Valves
- Service Brake and Inching Valves
- Compact solution "All in one"
- Steering Assist Brake Valves
- Trailer Brake Valves on Tractor

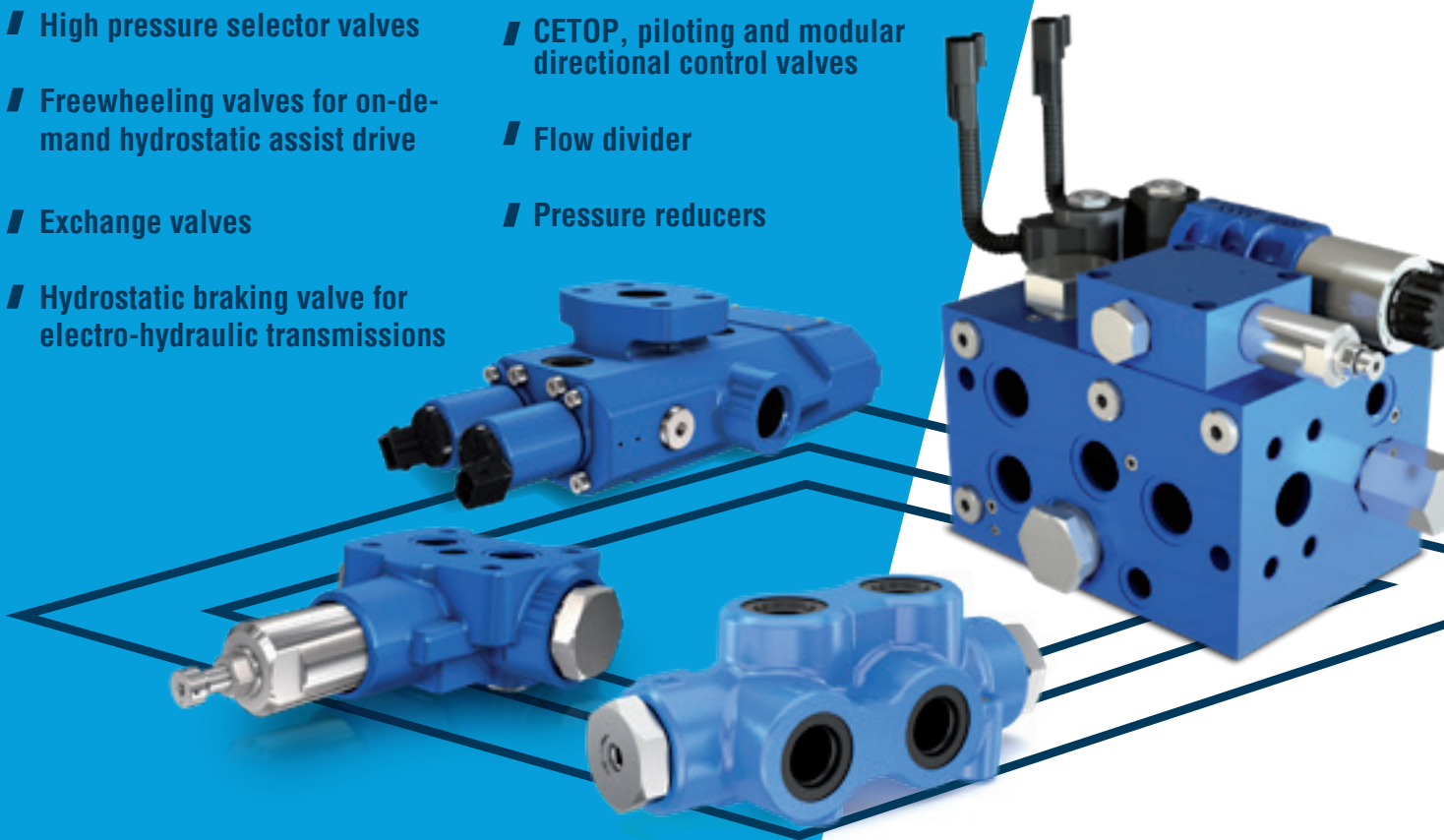
>p.98



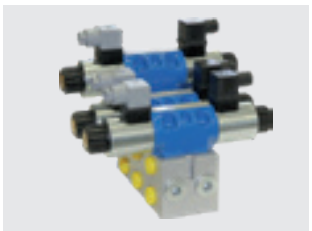
# DESIGNED FOR HYDROSTATIC TRANSMISSIONS AND TOOLS CONTROL

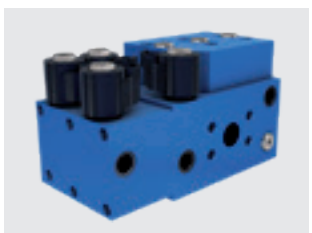
## SIZED TO OPERATE AT HIGH PRESSURE AND HIGH FLOW EFFICIENCY

- Steering valves
- Traction control electronic anti-slipping valves
- Traction control flow dividers
- High pressure selector valves
- Freewheeling valves for on-demand hydrostatic assist drive
- Exchange valves
- Hydrostatic braking valve for electro-hydraulic transmissions
- Serial protection valves
- Cross-Over Relief And Anti-Cavitation valves
- Selector - diverter valves
- CETOP, piloting and modular directional control valves
- Flow divider
- Pressure reducers



# MOTION CONTROL VALVES

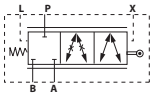
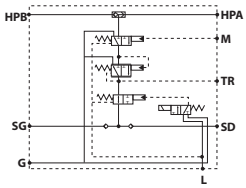




## Steering valves

### Twin-Lock™ valves

Twin-Lock™ is a unique proactive hydraulic traction control that automatically transfers torque to the wheels with the greatest ground adhesion. Since it eliminates the need for flow dividers, it dramatically reduces the heat generation and horsepower loss of conventional traction control systems.
Twin-Lock™ operates through a unique combination of serial and parallel connection between wheel motors.
The Twin-Lock™ valves prevent excessive pressure build-up in the serial lines, for instance when steering.

| | Number of positions | Weight | Max. operating pressure | Nominal flow range | Operation | Connections* | Hydraulic schematics |
|---|---|---|---|---|---|---|---|
| | | kg [lb] | bar [PSI] | l/min [GPM] | | | |
| **VDP (Twin-Lock™)**  | 2 | 2,6 [5.8] | 450 [6,526] | 26 - 50 [7 - 13] | Mechanical | Metric BSPP |   |
| | 3 | 3,3 [7.3] | | | | | |
| **PR-TL-SV (Twin-Lock™)**  | | 9,5 [20.9] | 450 [6,526] | 30 - 50 [7.9 - 13] | Hydraulic | Metric |   |

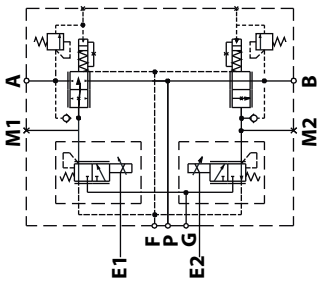
KVHP are high pressure directional control valves used in closed-loop circuits to change the turning direction of wheel(s).
The valve provides zero turning radius and/or sideway drive for forklift trucks.

| | Weight | Max. operating pressure | Max. flow | Operation | Voltage | Connections* | Hydraulic schematics |
|---|---|---|---|---|---|---|---|
| | kg [lb] | bar [PSI] | l/min [GPM] | | | | |
| **KVHP**  | 5 [11] | 450 [6,526] | 90 [23.8] | Electrical or Hydraulic | 12 V DC or 24 V DC | Metric |  |

## Traction control electronic anti-slipping valves

### Electronic anti-slipping valves

VMA anti-slipping valve is an electronically managed traction control. By using wheel speed sensors for splippage detection and proportional valves for flow throttle, valve restricts flow only when slippage is detected. Entirely programmable, the system easily accommodates varying pump displacements and vehicle steering geometry to offer optimal performance.
VMA can be installed by OEMs on production vehicles or offered as a conversion kit (Poclain Hydraulics motors just need to be eqipped with a pre-disposition for a speed sensor).

| | | Weight | Voltage | Max. operating pressure | Max.restricted flow | Connections* | Hydraulic schematics |
|---|---|---|---|---|---|---|---|
| | | kg [lb] | | bar [PSI] | l/min [GPM] | | |
| **VMA In-line model** |  | 7,2 [15.9] | 12 V DC or 24 V DC | 450 [6,526] | 20 [5.2] or 50 [13.2] | Metric UNF |  |
| **VMA Flanged model** |  | 11,9 [26.2] | | | | | |





## ANTI-SKIDDING SYSTEMS

### Increase the off-road capability of your machines

Wheel adherence is a critical factor with off road vehicles. Lose adequate wheel contact with the ground and you can lose control of your machine, put it temporarily out of service, cause premature tire wear, dramatically increase fuel consumption or churn up the site.

Poclain Hydraulics, has designed and developed systems to increase the performance of your machine on difficult ground conditions and steep gradients.

**Fully hydrostatic antiskid Twin-Lock™ system**
**> Page 126**

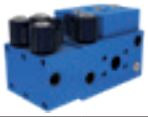
**Automatic electronic antiskid SD-CT Off-Road™ system**
**> Page 128**

## Traction control flow dividers

Flow divider controls the speed between wheels of the same axle or between different axles by dividing or combining the flow.
The flow divider is equipped with an electric or hydraulic controlled by-pass and can be used in open or closed loop circuits.

**FD-H**
**Heavy duty range**
**(up to 500 bar)**

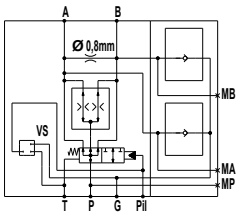
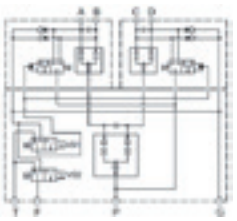

FD-H2-1


FD-H2-2

**FD-M**
**Medium duty range**
**(up to 420 bar)**


FD-M2

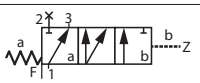
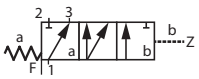

FD-M3
FD-M4

| | Max. weight kg [lb] | Number of outlets | Division Ratio** (% of max. flow) | Max. operating pressure bar [PSI] | Max. by-pass flow (ratio 50/50) l/min [GPM] | By-pass control | Connections* | Hydraulic schematics |
|---|---|---|---|---|---|---|---|---|
| **FD-H2-1 Heavy duty** | 19,0 [41.9] | 2 | 50-50<br>60-40<br>70-30<br>80-20 | 500 [7,252] | 200 [52.8] | Hydraulic or Electrical | BSPP, UNF |  |
| **FD-H2-2 Heavy duty** | | | | | 300 [79.3] | | | |
| **FD-M2 Medium duty** | 8,0 [17.6] | 2 | 50-50<br>70-30<br>60-40 | 420 [6,000] | 150 [39.6] | Hydraulic or Electrical | UNF<br>BSPP | FD-M4<br>  |
| **FD-M3 Medium duty** | 14,0 [30.9] | 3 | 33-33-33 | 420 [6,000] | 150 [39.6] | Electrical | | |
| **FD-M4 Medium duty** | 15,0 [33.1] | 4 | 25-25-25-25<br>30-30-20-20<br>33,5-33,5-16,5-16,5 | 420 [6,000] | 150 [39.6] | | | |

*Connecting dimensions: Metric = ISO 9974; BSPP = ISO 1179; UNF = ISO 11926-1, CETOP = ISO 4401
** Others ratio are available on-demand

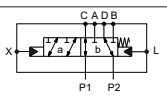
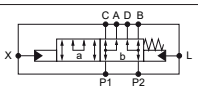
## High pressure selector valves

- Two position flow directional control valve
- High flow bypass, very high pressure capability
- Circuit isolation
- Tool selection

| | Weight kg [lb] | Max. operating pressure bar [PSI] | Max.flow range l/min [GPM] | Operation | Hydraulic schematics |
|---|---|---|---|---|---|
| **VD-2V2H20** | 8.5 [18.7] | 450 [6,526] | 170 [44.9] | Hydraulic 12-24 V DC |  |
| **VD-3V2H25** | 8.5 [18.7] | 450 [6,526] | 300 [79.2] | Hydraulic |  |

VD-3V2H20


KV-6/2 directional control valves are used for selection between two hydraulic cylinders or two hydraulic motors that do not operate simultaneously. KV-6/2 valve is also available with a spool that allows to switch between series and parallel motor connection in closed loop hydraulic circuits.

| | | | | | |
|---|---|---|---|---|---|
| **KV-6/2-16-H** | 16.8 [37.0] | 450 [6,526] | 300 [79.2] | Hydraulic |  |
| **KV-6/2-16-H-F** | 16.8 [37.0] | 450 [6,526] | 300 [79.2] | Hydraulic |  |

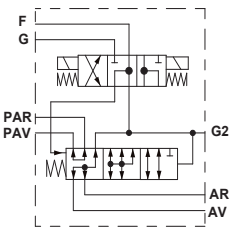
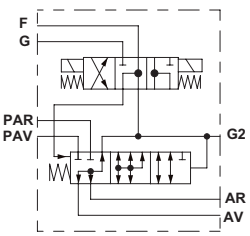
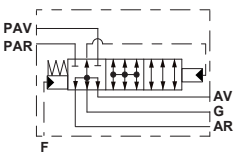
KV-6/2-16-H


## Freewheeling valves for on-demand hydrostatic assist drive

In an assist drive circuit, hydraulic motors are engaged when traction is needed, for instance, in rough terrain condition (off-road mode). At high speed (on-road mode) when traction condition is good, motors can be disengaged.
The freewheeling valve connects the high pressure ports of the motor to tank and allows pistons to stay retracted inside the cylinder-block: the motor is then freewheeled.
A pump by-pass option is of interest if the pump is only dedicated to the assist drive function.

VDF-H15

VDF-H25

| | Max. Weight | Max. operating pressure | Nominal flow range | Operation | Connections* | Hydraulic schematics | |
|---|---|---|---|---|---|---|---|
| | kg [lb] | bar [PSI] | l/min [GPM] | | | With pump by-pass | Without pump by-pass |
| **VDF H15** | 19,1 [42.1] | 450 [6,526] | 50 - 95 [13.2 - 25.0] | Electro-hydraulic 12-24 V DC | Piped Metric, BSPP |  |  |
| **VDF H25** | 39,3 [86.6] | 450 [6,526] | 170 - 300 [44.9 - 79.2] | Electro-hydraulic 12-24 V DC | Flanged | | |
| **VDF H25 for remote piloting** | | | | | | |  |







# ASSIST DRIVE

## On-Demand hydraulic transmission

Poclain Hydraulics offers an on-demand hydraulic transmission that provides the additional traction needed for working in difficult traction conditions like on muddy soil and/or on steep slopes. The system improves the machine's steerability on all soil conditions, bringing the best-in-class steering angle.

Poclain's hydraulic 4WD not only prevents the machines from getting stuck, but also helps users boost their productivity and decrease the TCO.

More information > Page 130

## Exchange valves

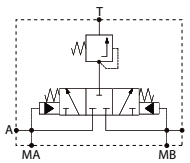
Compact exchange valves bleed hot oil from the low pressure side of a hydrostatic transmission circuit to be cooled, filtered or used as a source of oil for flushing pump and motor cases.
For all VE (except VE10), exchange pressure setting can be tuned by customer.


VE10

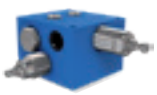
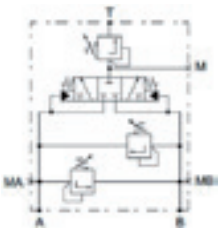

VE 30


VE 60HP Flanged


VE 60HP Piped

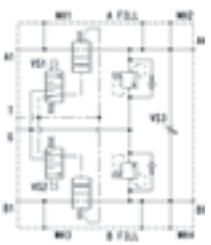
| | Weight | Max. operating pressure | Max.exchange flow | Pressure relief setting | High pressure relief setting | Connections* | | Hydraulic schematics |
|---|---|---|---|---|---|---|---|---|
| | kg [lb] | bar [PSI] | l/min [GPM] | bar [PSI] | bar [PSI] | Piped | Flanged | |
| **VE 10** | 1,1 [2,4] | 450 [6,526] | 10 [2.64] | 18 [261] or 20 [290] or 22 [319] | | ● | |  |
| **VE 30** | 1,5 [3.3] | 500 [7,252] | 30 [7.9] | 12 to 18 [174 to 261]<br>18 to 24 [261 to 348]<br>24 to 30 [348 to 435] | | ● | ● | |
| **VE 60 HP**** | 2,4 [5.3] Flanged<br>3,2 [7.1] Piped | 500 [7,252] | 60 [15.9] | 12 to 18 [174 to 261]<br>18 to 30 [261 to 435] | | ● | ● | |

**Available types of exchange: adjustable, fixed by wire, locked

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **VES 60**  | 7,3 [16.1] | 450 [6,526] | 60 [15.9] | 12 to 18 [174 to 261]<br>18 to 30 [261 to 435] | Up to 420 [6,091] (Factory setting) | ● | ● |  |

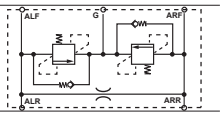
## Hydrostatic braking valve for electrohydraulic transmissions

Emergency hydrostatic braking valve provide hydrostatic braking to electrohydraulic machines when their battery is not operational (when battery is full or in cold environment).

| | | Weight | Max. operating pressure | Max. flow | Operation | Voltage | Connections* | Hydraulic schematics |
|---|---|---|---|---|---|---|---|---|
| | | kg [lb] | bar [PSI] | l/min [GPM] | | | | |
| **VCF** |  | 11,5 [25.3] | 450 [6,526] | 70 [18.5] | Electrical | 12 V DC | BSPP Flanged |  |

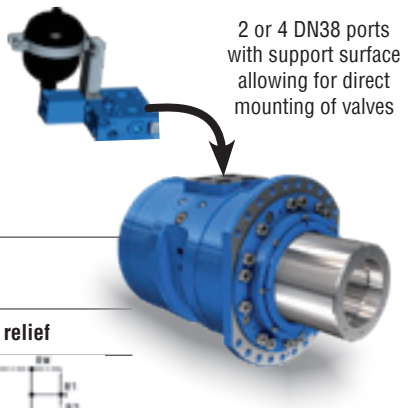
## Serial protection valves

Serial protection valve connects motors in serial line and provides protection of the motors against cavitation and overpressure.

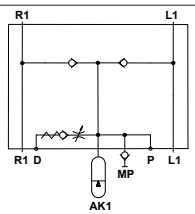
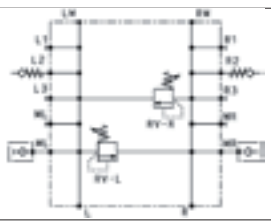
| | Max. operating pressure | Max.flow serial line | Max.flow cross line | Pressure relief setting | Connections* | Hydraulic schematics |
|---|---|---|---|---|---|---|
| | bar [PSI] | l/min [GPM] | l/min [GPM] | | | |
| **SP** | 420 [6,000] | 110 [29.0] | 63 [16.6] | Fix | UNF BSPP |  |
| | | 160 [42.3] | 75 [19.8] | | | |

## Cross-Over Relief and Anti Cavitation valve

CORAC valve, which is directly flanged on the industrial motor (MS83, MS125, MI250, MI330, MHP), will offer enhanced protection of the motor against possible cavitation during operation, by ensuring sufficient back pressure in the motor (additional flow provided by the accumulator).
This valve is available with two positions for the accumulator (0° or 90°).

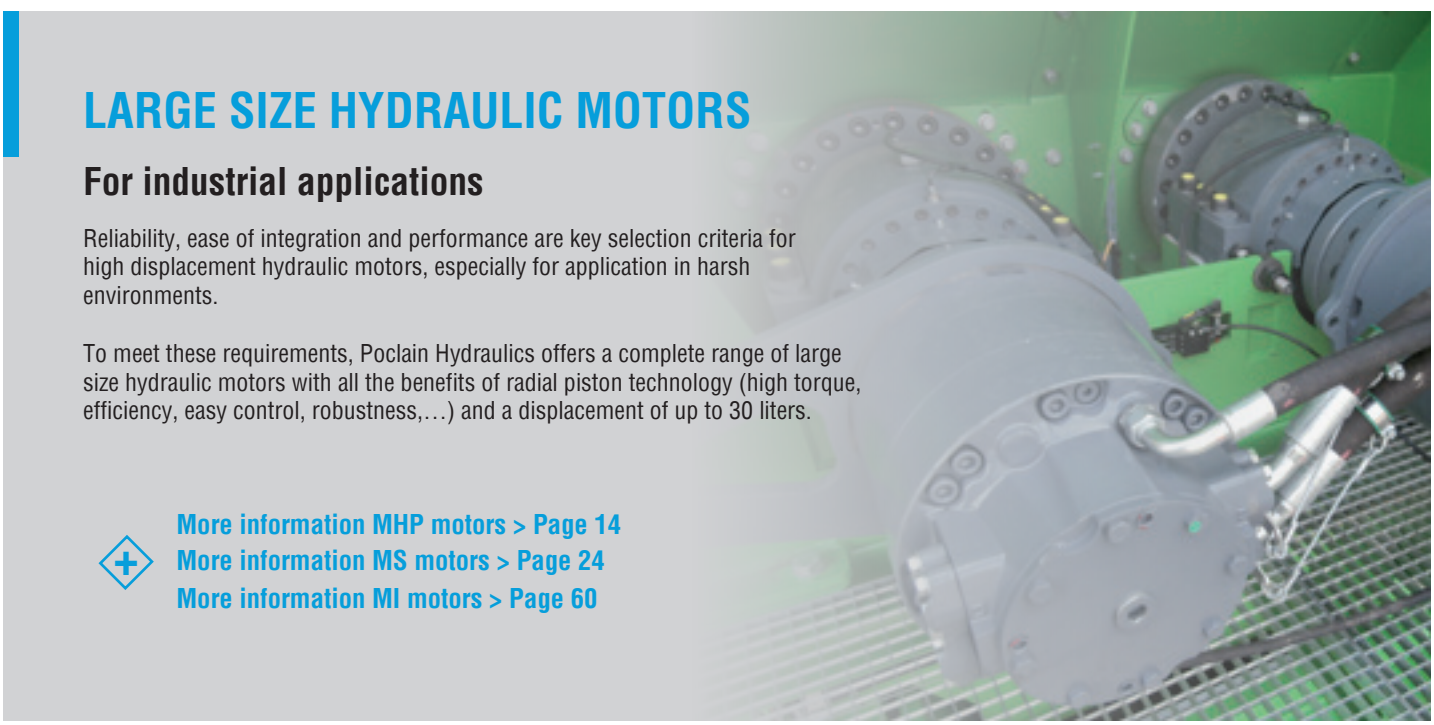


2 or 4 DN38 ports with support surface allowing for direct mounting of valves

| | Max. operating pressure | Precharge pressure | Volume | Hydraulic schematics | |
|---|---|---|---|---|---|
| | bar [PSI] | bar [PSI] | L [G] | Anti-cavitation | Cross-over relief |
| **Valve** | 420 [6,091] | - | - |  |  |
| **Accumulator** | 48 [696] | 12 [174] | 2 [0.53] | | |







# LARGE SIZE HYDRAULIC MOTORS

## For industrial applications

Reliability, ease of integration and performance are key selection criteria for high displacement hydraulic motors, especially for application in harsh environments.

To meet these requirements, Poclain Hydraulics offers a complete range of large size hydraulic motors with all the benefits of radial piston technology (high torque, efficiency, easy control, robustness,…) and a displacement of up to 30 liters.

More information MHP motors > Page 14
More information MS motors > Page 24
More information MI motors > Page 60

## Selector - diverter valves

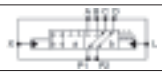
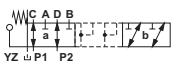
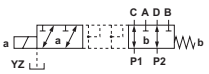
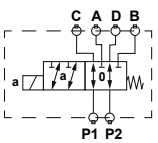
### 6/2 selector valves

Selector – diverter directional control valves are used for selection between two hydraulic cylinders or two hydraulic motors that do not operate simultaneously.

KV6K2

KV-6/2-6

KV-6/2-6

| | Actuation | Size (NG) | | | | Max. operating pressure | Flow rate | Non modular in line connection | Weight | Hydraulic schematics (examples) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 8 | 10 | 16 | bar [PSI] | l/min [GPM] | | kg [lb] | |
| **KV** | Hydraulic | | | | ● | 450 [6,527]* | 300 [79.3] | SAE, UNF | 16,8 [37.0] |  |
| **KV** | Mechanical | ● | | | | 350 [5,077]* | 60 [15.8] | Metric, BSPP, UNF | 2,4 [5.3] |  |
| | | | | ● | | 350 [5,077]* | 120 [31.6] | Metric, BSPP, UNF | 5,3 [11.7] | |
| **KV** | Electrical | ● | | | | 350 [5,077]* | 50 [13.2] | Metric, BSPP, UNF | 2,5 [5.5] |  |
| | | | | ● | | 350 [5,077]* | 120 [31.6] | Metric, BSPP, UNF | 5,5 [12.1] | |
| | | | | | ● | 350 [5,077]* | 250 [65.8] | BSPP, UNF | 22 [48.5] | |
| **KV6K2** | Electrical | ● | | | | 350 [5,077]* | 50 [13.2] | Metric, BSPP, UNF | 2,9 [6.4] |  |
| | | | ● | | | 350 [5,077]* | 90 [23.8] | Metric, BSPP, UNF | 4,8 [10.6] | |

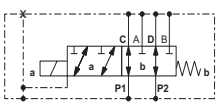
* 250 bar [3,626 PSI] without drain release.

### 6/2 selector valves for modular mounting

KVH-6/2-8

KVH-6/2-10 (N2)

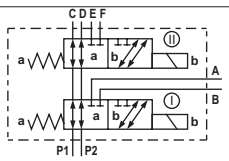
KVH-6/2-6 (N3)

| | Actuation | Size (NG) | | | Max. operating pressure | Flow rate | Non modular in line connection | Weight | Hydraulic schematics (examples) |
|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 8 | 10 | bar [PSI] | l/min [GPM] | | kg [lb] | |
| **KVH** | Electrical | ● | | | 315 [4,569]* | 50 [13.2] | Metric, BSPP, UNF | 2,7 [5.9] |  |
| | | | ● | | 350 [5,077]* | 90 [23.8] | Metric, BSPP, UNF | 3,8 [7.7] | |
| | | | | ● | 315 [4,569]* | 120 [31.6] | Metric, BSPP, UNF | 5,5 [12.1] | |

* 250 bar [3,626 PSI] without drain release.

### 8/3 selector valves

KV-8/3-6

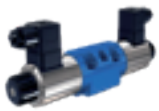
| | Actuation | Size (NG) | Max. operating pressure | Flow rate | Non modular in line connection | Weight | Hydraulic schematics (examples) |
|---|---|---|---|---|---|---|---|
| | | 6 | bar [PSI] | l/min [GPM] | | kg [lb] | |
| **KV** | Electrical | ● | 250 [3,626] | 50 [13.2] | Metric, BSPP, UNF | 3,8 [8.4] |  |

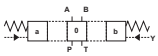
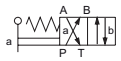
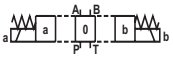
## CETOP, piloting and modular directional control valves

### CETOP directional control valves

Valves for sub-plate connection to ISO 4401
4/2 and 4/3 version.

KV-5KL



| | Actuation | Size (NG) | | Max. operating pressure | Flow rate | Modular Mounting* | Weight | Hydraulic schematics (examples) |
|---|---|---|---|---|---|---|---|---|
| | | 6 | 10 | bar [PSI] | l/min [GPM] | | kg [lb] | |
| **KV** | Hydraulic | ● | | 350 [5,077] | 80 [21.1] | CETOP | 1,4 [3.1] |  |
| | | | ● | 350 [5,077] | 130 [34.2] | CETOP | 4,0 [8.8] | |
| **KV** | Mechanical | ● | | 350 [5,077] | 60 [15.8] | CETOP | 2,0 [4.5] |  |
| | | | ● | 350 [5,077] | 100 [26.4] | CETOP | 5,2 [11.5] | |
| **KV (5KL)** | Electrical | ● | | 350 [5,077] | 75 [19.8] | CETOP | 2,2 [4.9] |  |
| **KV (5KO)** | Electrical | | ● | 350 [5,077] | 120 [31.6] | CETOP | 7,3 [16.1] | |

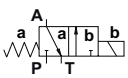
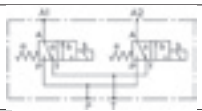
### Piped valves for piloting functions and by-pass

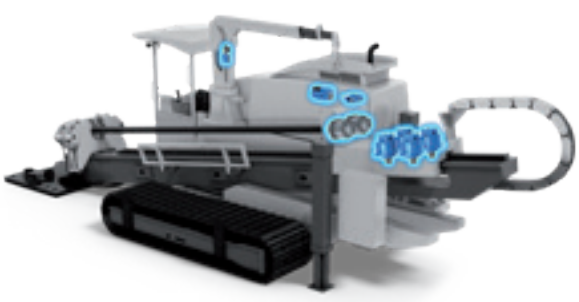
KVC-3/2

This valve (NG 10) can be used to by-pass one half of a Twin-Lock ™ motor to create a two speeds machine.

KVC2-3/2

This valve is often used to control parking brake actuation and displacement switch of motors.

| | Actuation | Size (NG) | | | Max. operating pressure | Flow rate | Non modular in line connection | Weight | Hydraulic schematics (examples) |
|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 6 | 10 | bar [PSI] | l/min [GPM] | | kg [lb] | |
| **KVC-3/2-4** | Electrical | ● | | | 160 [2 320] | 16 [4.2] | Metric, BSPP | 1,6 [3.5] |  |
| **KVC-3/2-10** | Electrical | | | ● | 350 [5 077] | 100 [26.4] | Metric, BSPP, UNF | 7,1 [15.6] | |
| **KVC2-3/2-4** | Electrical | ● | | | 160 [2 320] | 16 [4.2] | Metric, BSPP, UNF | 3,5 [7.7] |  |
| **KVC-4/2-6** | Electrical | | ● | | 210 [3 046] | 40 [10.6] | BSPP | 2.1 [4.6] |  |



*Connecting dimensions: Metric = ISO 9974; Gas = ISO 1179; UNF = ISO 11926-1, CETOP = ISO 4401

## KVM valves for modular mounting

KVM are bankable directional control valves that enable very flexible and optimized solutions without base manifold and easy do adapt to any application. The KVM valve solution consists of inlet block with many options, directional control valves (on/off or proportional), vertical stacking valves (e.g. PO check valve) and end plate. For better machine efficiency they come also with load sensing ports.

KVM 4/2 

KVM 4/3 

KVM-VV 

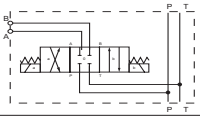
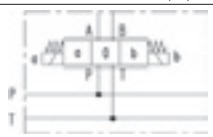
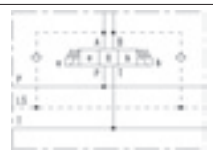
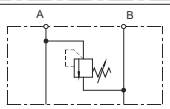
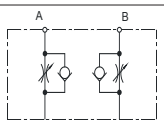
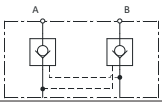
KVM-NDV 

KVM-NOV 

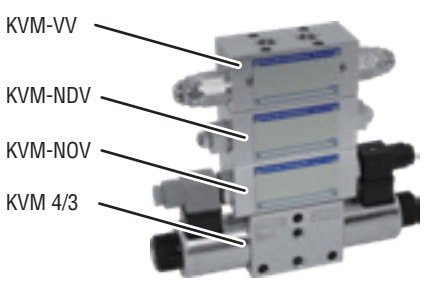
OB Inlet block 

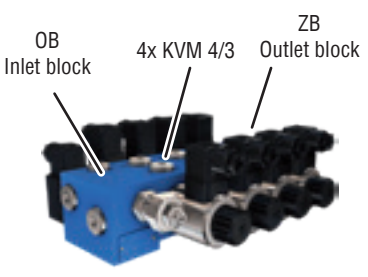
ZB Outlet block 

Screw set SET-KVM 

| | Size (NG) | Max. operating pressure | Flow rate | Actuation | Modular Mounting* | Non modular in line connection | Weight | Hydraulic schematics (examples) |
|---|---|---|---|---|---|---|---|---|
| | 6 | bar [PSI] | l/min [GPM] | | | | kg [lb] | |
| **KVM-On/Off (4/2 and 4/3)** | ● | 350 [5,077] | 40 [10.5] | Electrical | Bankable | Metric, BSPP, UNF | 2,4 [5.3] |  |
| **KVM6-PO (Proportional) (4/2 and 4/3)** | ● | 350 [5,077] | 30 [7.9] | Electrical | Bankable | Metric, BSPP, UNF | 2,4 [5.3] |  |
| **KVM-PL (Load sensing signal)** | ● | 350 [5,077] | 40 [10.5] | Electrical | Bankable | Metric, BSPP, UNF | 2,4 [5.3] |  |
| **KVM-VV (pressure relief valve)** | ● | 350 [5,077] | 40 [10.5] | | Bankable | | 1,8 [4.0] |  |
| **KVM-NDV (Throttle with check valve)** | ● | 350 [5,077] | 40 [10.5] | | Bankable | | 1,5 [3.3] |  |
| **KVM-NOV (Pilot operated check valve)** | ● | 350 [5,077] | 40 [10.5] | | Bankable | | 1,4 [3.1] |  |
| **OB-Inlet block** | ● | 350 [5,077] | 40 [10.5] | | Bankable | In line | 1,2 to 4.5 [2.7 to 9.9] | |
| **ZB-Outlet block** | ● | 350 [5,077] | 40 [10.5] | | Bankable | In line | 0,8 [1.8] | |
| **Screw set SET-KVM** | ● | | | | | | | |

### Vertical stacking ⊕ Bankable mounting




*Connecting dimensions: Metric = ISO 9974; Gas = ISO 1179; UNF = ISO 11926-1, CETOP = ISO 4401

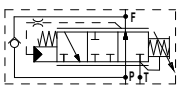
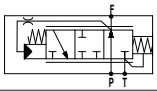
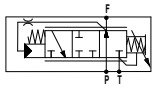
## Flow divider

| | Size (NG) | | Max. operating pressure | Flow rate | Connections* | Weight | Hydraulic schematics |
|---|---|---|---|---|---|---|---|
| | 6 | 10 | bar [PSI] | l/min [GPM] | | kg [lb] | |
| DTP | ● | | 350 [5 076] | 20 to 70 [5.3 to 18.5] | in line Metric, BSPP, UNF | 1,7 [3.8] |  |
| | | ● | 350 [5 076] | | | 2,7 [5.9] | |

DTP

## Pressure reducers

Pressure reducing valves limit the pressure in motor brake line or in auxiliary functions line.

| | Type of setting | Weight | Pressure setting range | Max. operating pressure | Max.flow | Hydraulic schematics | |
|---|---|---|---|---|---|---|---|
| | | kg [lb] | bar [PSI] | bar [PSI] | l/min [GPM] | With check valve | Without check valve |
| PR3-...-S  | Fix | 0.7 [1.54] | 10 to 120 [145 to 1,740] | 250 [3,626] | 30 [7.92] |  |  |
| PR3-...-V  | Variable | | | | | |  |

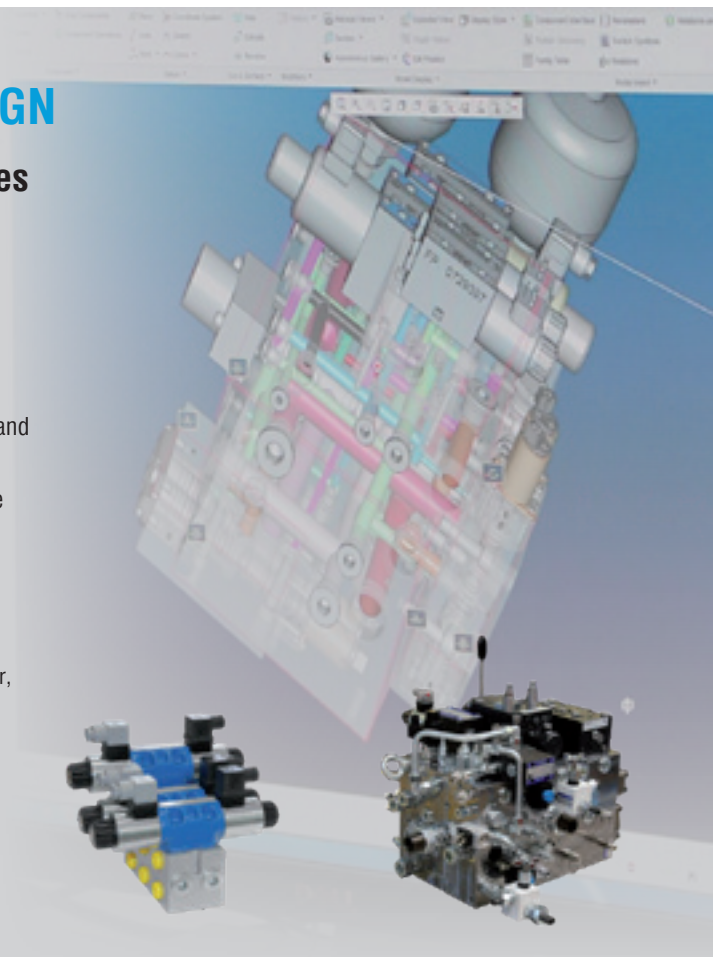


## HIGH EXPERTISE IN VALVE DESIGN

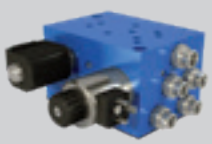
### Combined combo and multifunctions valves

Combo and multifunction valves bring several benefits:

- Better efficiency with optimal channeling and less piping
- Lower risk of leakages
- Increased safety with fewer hoses under high pressure
- Decreased costs associated with the elimination of piping, hoses and other components (fixation elements)
- Ports positioning, fixation, dimensions, and surface protection are adapted to the needs of the machine
- Less needed space on the machine
- Easy and quick to install into the machine



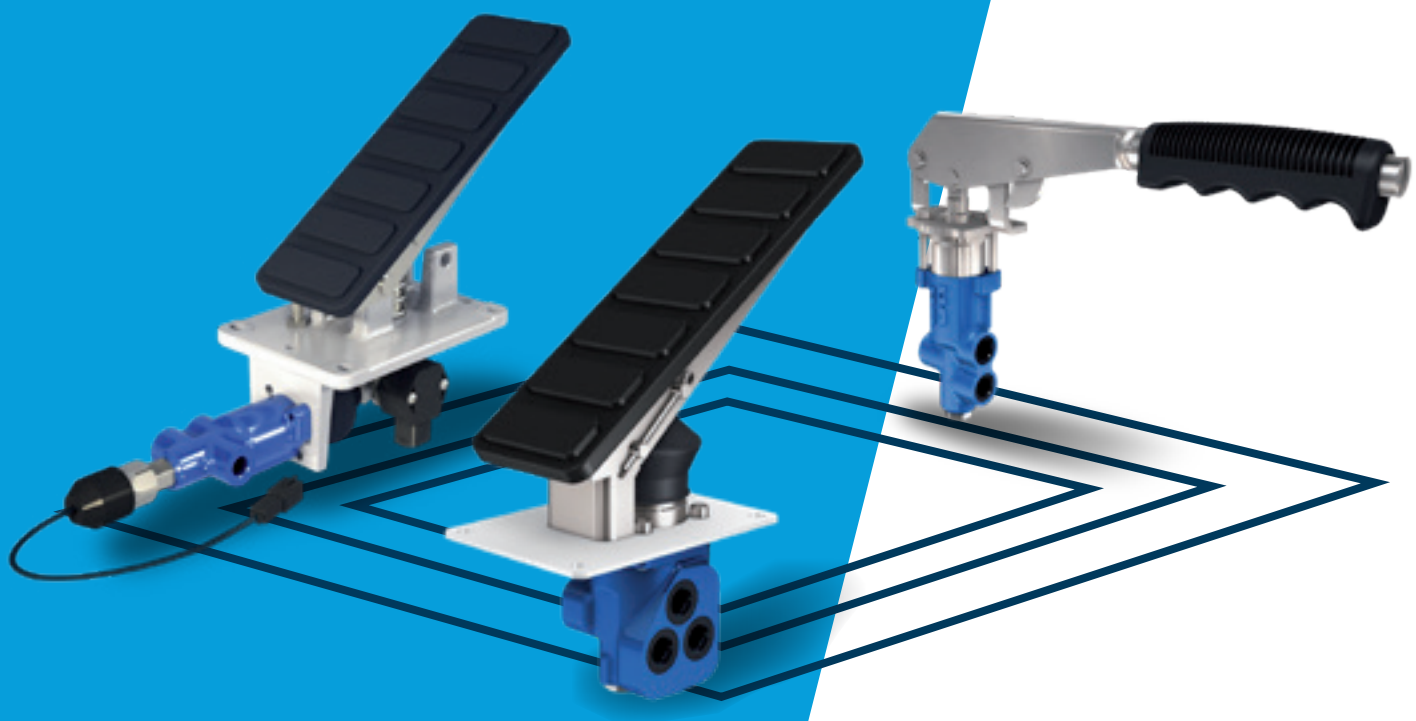
Flow divider and diverter



Combo freewheeling, flow divider, exchange, brake release

# VARIOUS BRAKING FUNCTIONS
## FOR ALL TYPES OF HYDRAULIC CIRCUITS

- Parking and emergency brake valves
- Service brake valves
- Service brake valves + inching
- Service brake valves with remote piloted hydraulic control
- Accumulator charging valves
- Service brake and accumulator charging valves
- Compact solutions «all in one»

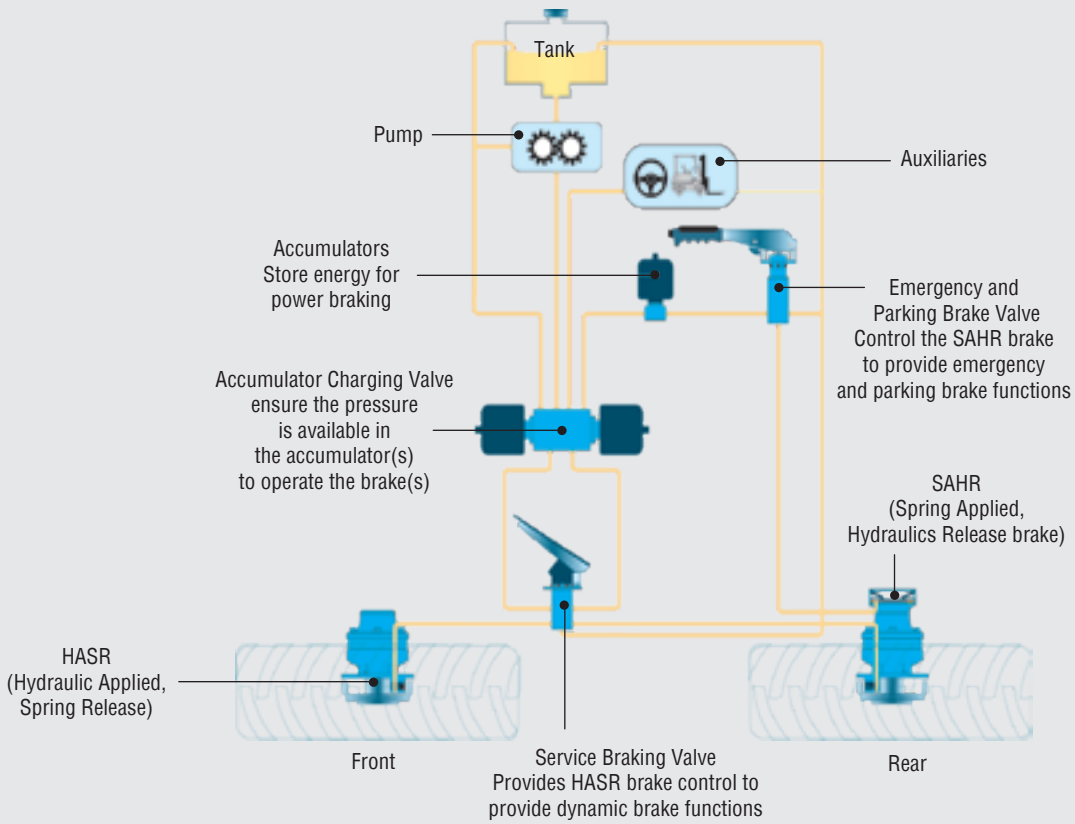


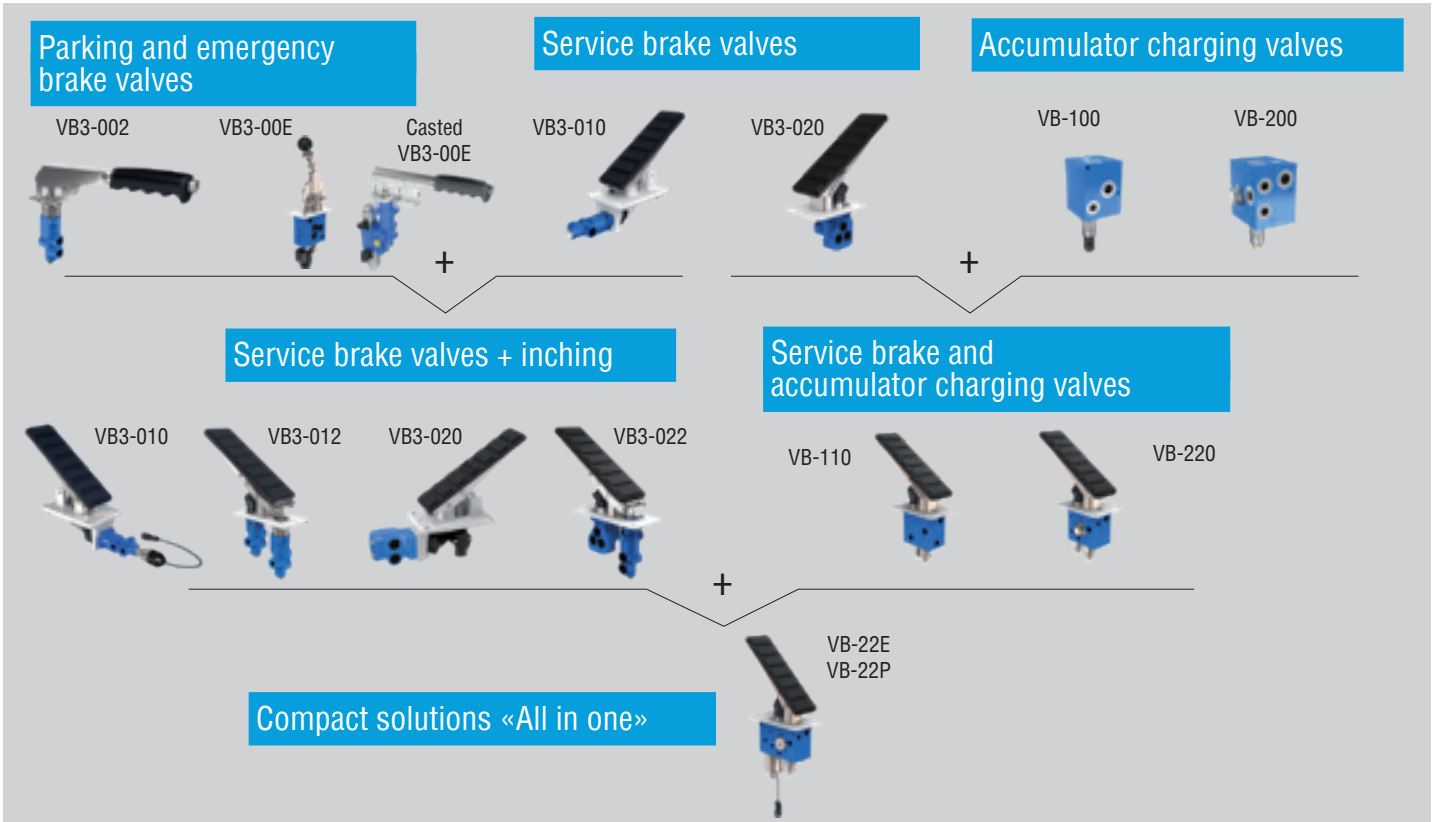
# BRAKE VALVES

## Advantages of hydraulic brake valves (power braking type) are numerous

- No need for an additional supply source (air compressor)
- Valves are fed by the hydraulic source on the machine
- Hydraulic accumulators are smaller than air reservoirs
- Faster response time thanks to available reserve of energy in accumulators
- Fewer risks of system contamination and no need for additional filters
- Comfortable and progressive feel

**The Poclain Hydraulics braking systems can be adapted to handle your specific braking requirements.**






## Parking and emergency brake valves

| | Weight | Max. inlet pressure | Brake operating pressure | Circuit | Control | Actuator |
|---|---|---|---|---|---|---|
| | kg [lb] | bar [PSI] | bar [PSI] | | | |
| **VB3-002*** | 0,9 [2.0] | 250 [3,626] | 10 - 150 [145 - 2,175] | Single-circuit | Reverse modulating Hydraulic | Horizontal / Vertical lever Floor / Wall mount pedal |
| **VB3-00E** EU 2015/68 | 3,0 [6.6] | | 10 - 150 [145 - 2,175] | Single-circuit | Reverse modulating Electro-hydraulic | Horizontal / Vertical lever Wall mount pedal |
|  EU 2015/68 | | | | | | |
| **VB-00M** | 3,8 [8.38] | | 30 - 120 [435 - 1,740] | Single-circuit | On-Off | Electrical and Manual |
| | 4,3 [9.48] | | | Dual-circuit | | |

*** NEW! Available in high flow & high force pedal feedback (VB4-002)**

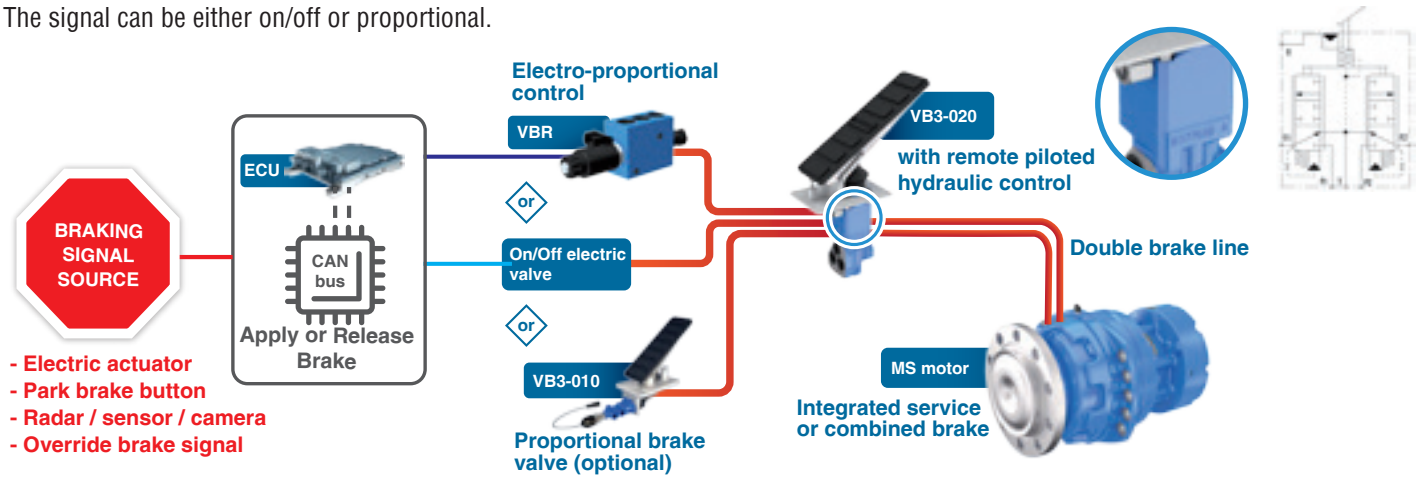
## Service brake valves and inching

| | Weight | Max. inlet pressure | Brake operating pressure | Brake type | Circuit | Control | Actuator |
|---|---|---|---|---|---|---|---|
| | kg [lb] | bar [PSI] | bar [PSI] | | | | |
| **VB3-010*** | 1,0 [2.2] | 250 [3,626] | 20 - 150 [290 - 2,175] | Service brake | Single-circuit | Modulating Mechanical | Floor / Wall mount pedal |
| **VB3-020*** | 2,0 [4.4] | | 20 - 150 [290 - 2,175] | | Dual-circuit | Modulating Mechanical | Floor / Wall mount pedal |
| **VB3-012** | 3,5 [7.7] | | 20 - 150 [290 - 2,175] | Service brake and inching | Single-circuit | Combined VB3-002 + VB3-010 | Floor mount pedal |
| **VB3-022** | 4,1 [9.0] | | 20 - 150 [290 - 2,175] | | Dual-circuit | Combined VB3-002 + VB3-020 | Floor mount pedal |

*** NEW! Available in high flow & high force pedal feedback (VB4, VB5) and with electrical inching and pedal position sensor.**

## Service brake valves with remote piloted hydraulic control

VB3-020 can be equipped with a remote piloted hydraulic control allowing override hydraulic brake signal.
The signal can be either on/off or proportional.




## Accumulator charging valves

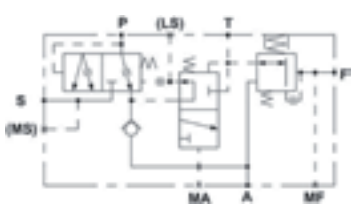
| | Weight | | | Max. inlet pressure | Cut-in/ cut-out pressure range | Flow rate | |
|---|---|---|---|---|---|---|---|
| | | | | | | To auxiliary | To accumulator |
| | kg [lb] | Circuit | Control | bar [PSI] | bar [PSI] | l/min [GPM] | l/min [GPM] |
| **VB-100** | 2,2 [4.8] | Single-circuit | Hydraulic | 250 [3,626] | 110 / 130 [1,595 / 1,888]<br>120 / 140 [1,740 / 2,031]<br>135 / 160 [1,958 / 2,321]<br>160 / 190 [2,321 / 2,756] | 45 - 120 [11.9 - 31.7] | 2.75 - 15 [0.73 - 3.96] |
| **VB-200** | 4.0 [8.8] | Dual-circuit | Hydraulic | | 170 / 200 [2,466 / 2,901]<br>180 / 210 [2,611 / 3,046] | | |

## Compact solutions «All in one»

| | Weight | | | Cut-in/ cut-out pressure range | Brake operating pressure | Flow rate | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | To auxiliary | To accumulator | |
| | kg [lb] | Circuit | Control | bar [PSI] | bar [PSI] | l/min [GPM] | l/min [GPM] | Actuator |
| **VB-110** | 5,0 [11.0] | Single-circuit | Hydraulic | 110 / 130 [1,595 / 1,888]<br>120 / 140 [1,740 / 2,031]<br>135 / 160 [1,958 / 2,321]<br>160 / 190 [2,321 / 2,756]<br>170 / 200 [2,466 / 2,901]<br>180 / 210 [2,611 / 3,046]<br>205 / 240 [2,973 / 3,481]* | 30 - 120 [435 - 1,740] | 45 - 120 [11.9 - 31.7] | 2.75 - 15 [0.73 - 3.96] | Floor mount / Lockable pedal |
| **VB-220** | 6.0 [13.2] | Dual-circuit | Hydraulic | | | | | |
| **VB-22E** | 8.0 [17.6] | Dual-circuit + parking brake | Electro hydraulic | | | | | |
| **VB-22P** | | | Proportional Electro hydraulic | | | | | |

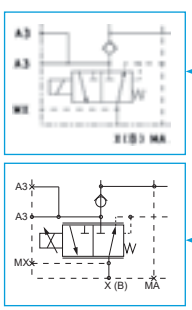
* Only available for VB-110 and VB-220 valves.

VB-110

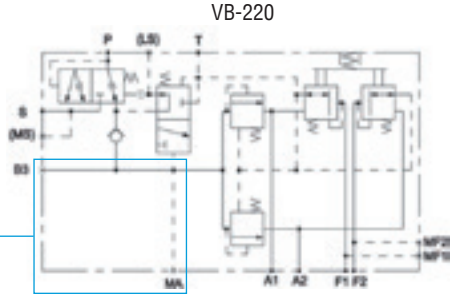



VB-22E

VB-22P




VB-220



# TRACTOR AND DUAL LINE TRAILER BRAKING SOLUTIONS

## Valves compatibility and modularity

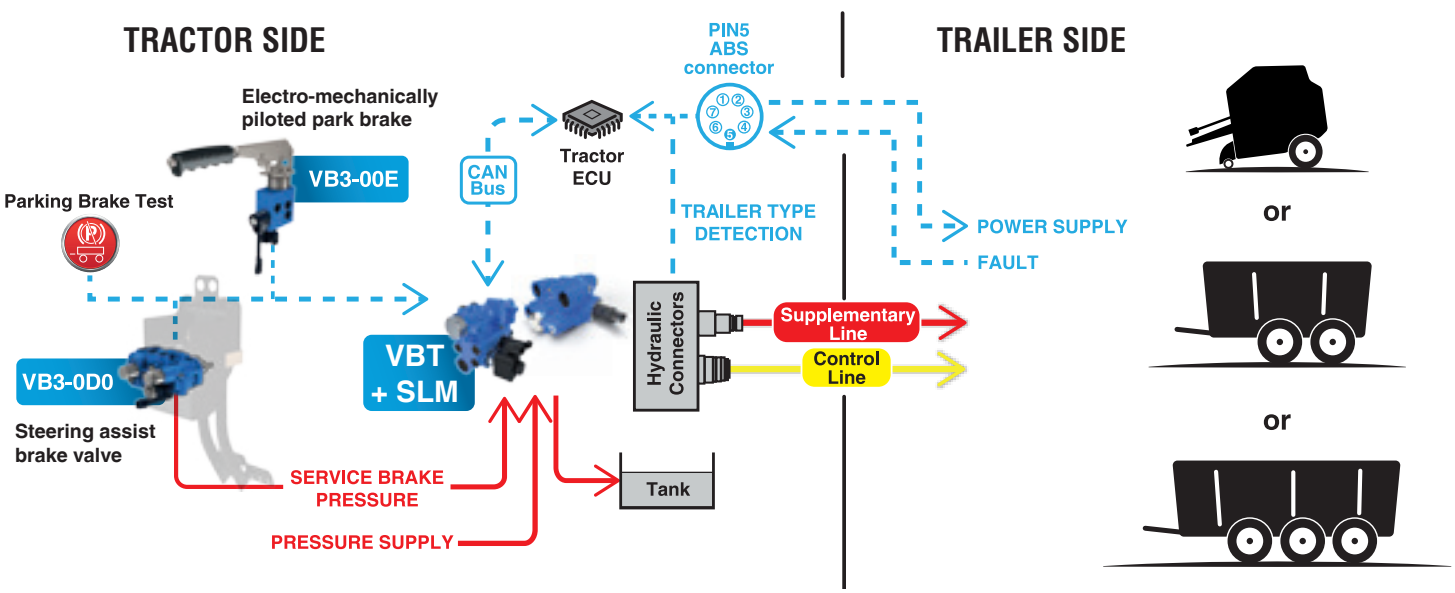
Whether you want to fit Hydraulic or Electro-hydraulic brake valves on your tractor/trailer, you can choose any of our products.
It is possible to mix and match hydraulic and electro-hydraulic components.

Poclain Hydraulics can design specific brake valves to answer your needs regarding space constraints, function integration, and/or develop specific performance characteristics.

| | | Hydraulic solution | Electro-hydraulic solution |
|---|---|---|---|
| 1 | Parking and emergency brake valves | VB3-002 | VB3-00E |
| 2 | Steering assist valves | VB3-0B0<br>VB3-0D0 | |
| 3 | Trailer brake valves | VFR-0HX | VBT<br>SLM<br>VFR-xEA |

DESIGNED FOR EU2015/68

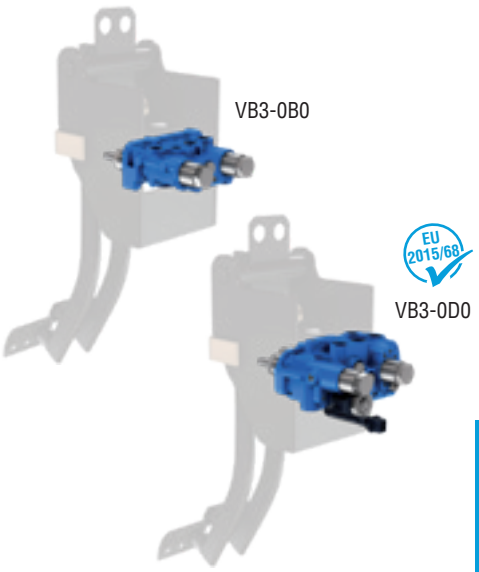

More information > Page 136



## Steering assist valves

**The VB3-0B0 and VB3-0D0 valves, combined with a double brake pedal, have the following functionalities:**

- Off-road: steering assist braking for field work gives U-turn capability by braking the inner rear wheel. Each of the circuit selectors are associated with one of the pedals.
- On-road: mechanically linked pedals allow effective service braking.
- Dual circuit steering assist valve (VB3-0D0) acts on brakes in rear and front axles which improves driving control and safety.
- VB3-0D0 always allows independent braking in case of circuit leakage on one of the axles.




| | | Weight | Max. inlet pressure | Max. brake operating pressure |
|---|---|---|---|---|
| | | kg [lb] | bar [PSI] | bar [PSI] |
| **VB3-0B0** | Steering assist brake (Single circuit) | 7,0 [15.4] | 250 [3,626] | 150 [2,176] |
| **VB3-0D0** | Steering assist brake (Dual circuit) | 7,0 [15.4] | 250 [3,626] | 150 [2,176] |

## Trailer brake valves

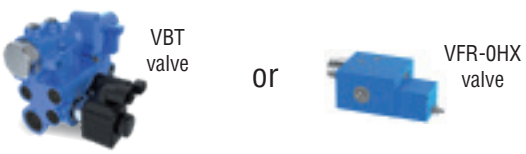
Trailer brake valves allow to apply the trailer brake pressure based on the tractor brake pressure. They supply auxiliary equipment and are therefor equipped with a priority spool in order to supply the trailer brakes when needed (i.e. the priority is given to the brakes).

**The VFR Valves** are simple single circuit trailer service brake, hydraulically or electrically piloted, mounted on the tractor.

**The VBT and SLM* valves** are electronically piloted valves with easy software control.
Valves and software package is designed for compliance to EU-2015/68 regulation on dual line trailer braking.

* Supplementary Line Module

**For single circuit**



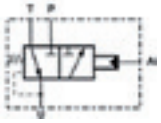

**For dual circuit**


| | | | Weight | Flow rate | |
|---|---|---|---|---|---|
| | | | | To brake | To auxiliary |
| | Control | Circuit | kg [lb] | l/min [GPM] | l/min [GPM] |
| **VBT** | Electronic | Single | 10 [22] | 70 [18.5] | 100 [26.5] |
| **VBT + SLM** | | Dual | 16 [35.2] | 70 [18.5] | 100 [26.5] |
| **VFR-0HX** | Hydraulic | Single | 6,5 [14.3] | 50 [13] | 200 [53] |
| **VFR-xEA** | Electronic | Single | 6,5 [14.3] | | |

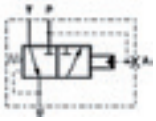
## Relay valves

- For large volume brake actuation
- For long braking lines
- Fast tank return
- Remote electric actuation of service brake

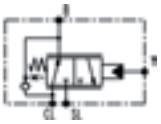
Relay valve



Quick return valve



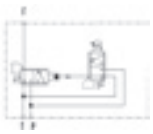
Brake force limiter valve



| | Weight | Max. input pressure | Max. flow rate to brake | Circuit | Control |
|---|---|---|---|---|---|
| | kg [lb] | bar [PSI] | l/min [GPM] | | |
| **Relay-single** | 2,5 [5.5] | 250 [3,626] | 70 [18.50] | Single-circuit | Hydraulic |
| **Relay-dual** | 4,0 [8.8] | 250 [3,626] | 70 [18.50] | Dual-circuit | Hydraulic |

## Electrically piloted brake valve

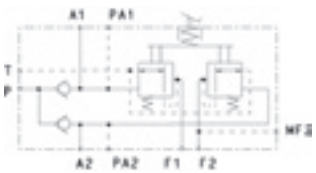
| | Weight | Brake operating pressure | Max. flow rate to brake | Brake type | Pressure control |
|---|---|---|---|---|---|
| | kg [lb] | bar [PSI] | l/min [GPM] | | |
| **VBR-010** | 2,5 [5.5] | 10 - 115 [145 - 1,667] | 20 [5.28] | Service brake | Proportional |



## Customized VB valves

Special combo designs are custom made and bring several benefits to specific requirements of a customer:

- Protection of accumulators from AUX over pressure
- Adaptation of pushing elements on VB3-010 (roller, thread)
- Integration of two braking valves on one actuator
- Integration of additional remote hydraulic piloting on standard braking valves
- Customization of mechanical actuators according to customer needs
- Accumulators can be integrated directly to accumulator charging valve or piped to the brake valve




VALVES

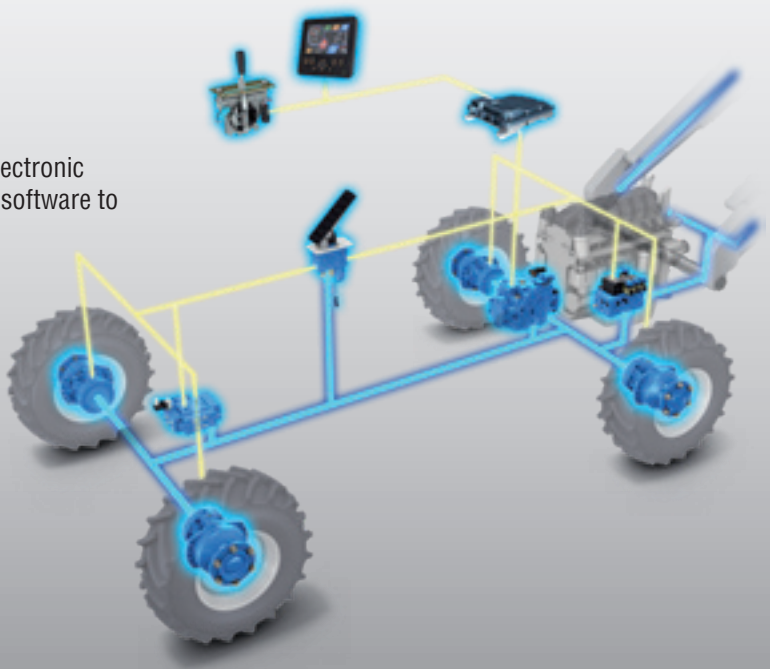
# ELECTRONICS

# ELECTRONIC MANAGEMENT
## OF HYDROSTATIC TRANSMISSIONS

### Ready-to-use solutions
Well suited to the architecture of your machine, our electronic solutions can be integrated without additional major investments. You control the costs and time-to-market of your machines.

### Solutions that improve the performance and the control of your machines
The combined efficiencies of our Electronic Control Units and our software can optimize your machine by adjusting their performances exactly to your needs.

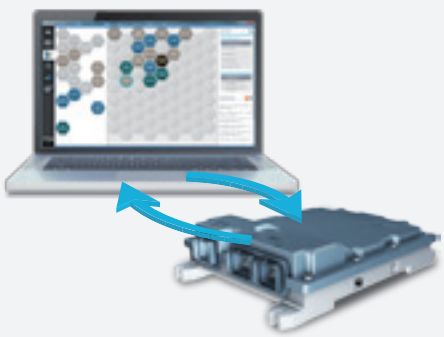
### Customizable and easy to use
With intuitive ergonomic interfaces, the handling of our electronic solutions is simple and fast. It is easy to set up your own software to achieve the desired performance.



## DESIGNED TO CONTROL THE MOST DEMANDING MACHINES

**SMARTDRIVE CT**

HIGH PERFORMANCE



p.108

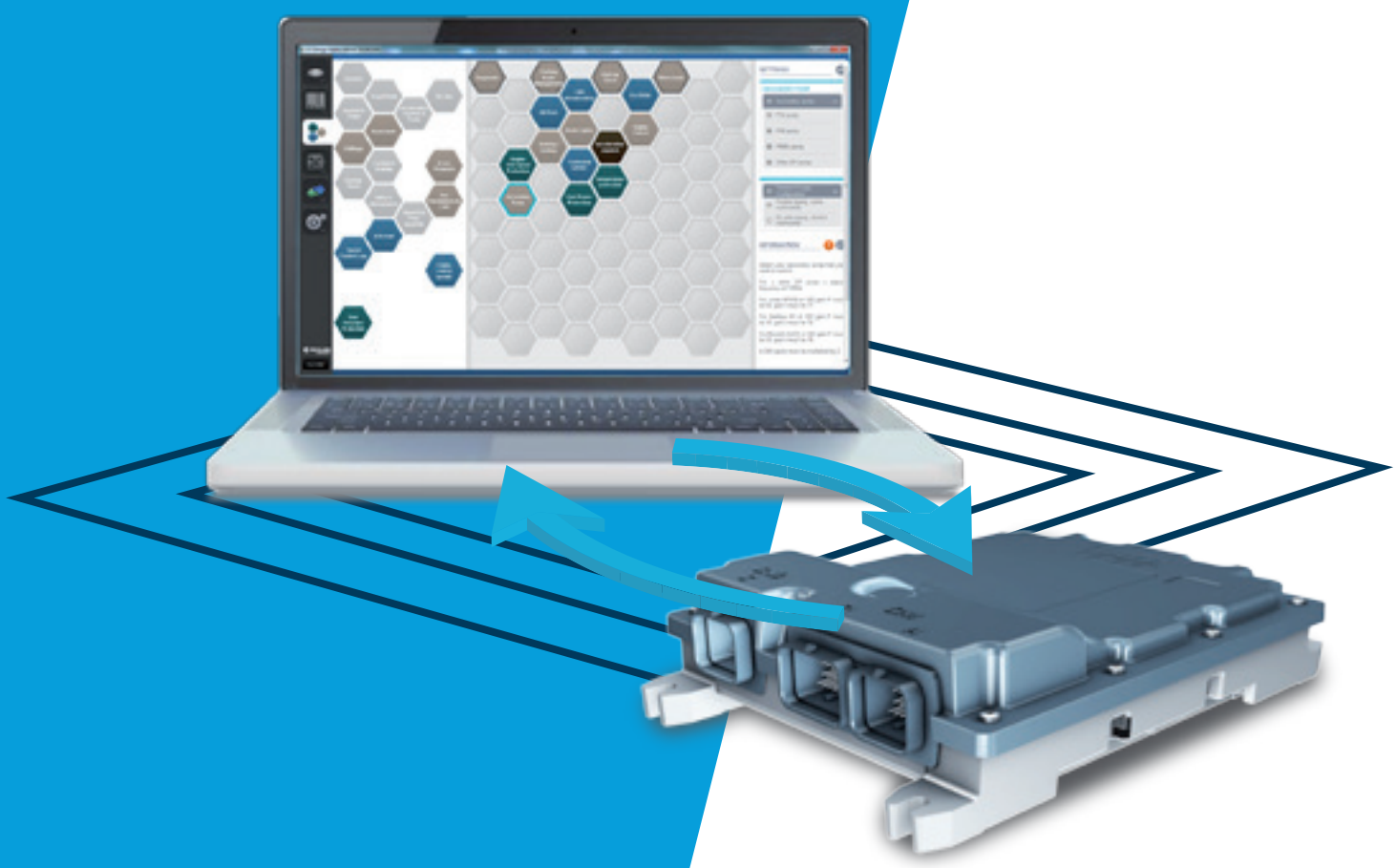
## HARDWARE TO COMMAND AND CONTROL

**ACTUATORS & SENSORS**

p.116

# DESIGNED TO CONTROL
## THE MOST DEMANDING MACHINES

- Off-road and on-road applications
- E13 10R-04 12836 certified
- Ag PI-d, PI-d, SIL2 performance levels
- Generic embedded softwares
- Configuration and diagnostic tools



# SD-CT ECU AND SOFTWARES

**SD-CT-200/300**
**CT-SUITE**
**CT-DESIGN**
**EBOM-BUILDER**
**PHASES-CT**

## High level of performance

The SD-CT ECUs are compatible for use in both on-road and off-road applications, particularly because of their electromagnetic compatibility certified by their E marking and their safety-assurance architecture capable of reaching performance Ag-PI-d, PI-d and SIL2 level.

## Calculation power

SD-CT ECUs are made efficient by incorporating an electronic architecture built around a 32-bit microprocessor and a 8-bit auxiliary microprocessor. They have a calculation capability compatible with your machines' safety, comfort and energy efficiency requirements. These technical characteristics provide access to sophisticated software functions that guarantee efficient and accurate control of your applications.

## Communication

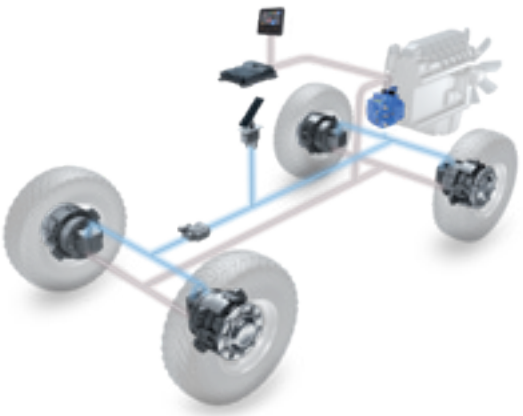
The SD-CT ECUs have large communication capabilities. The three integrated CAN buses allow you to share information (engine, hydraulic components, etc.), and configure and diagnose your machine without overloading the CAN buses.
Equipped with 40 high-power inputs and 22 high-power outputs, they provide accurate control of the hydrostatic transmission.

## Robustness

SD-CT ECUs are designed to be used in extreme conditions. Operational over a temperature range of - 40°C to +85°C [-40°F to 185°F], they also operate in the case of immersion of up to under one meter of water (IP67).
Their electromagnetic compatibility (EMC), certified 'E', makes them compatible with the most demanding uses.

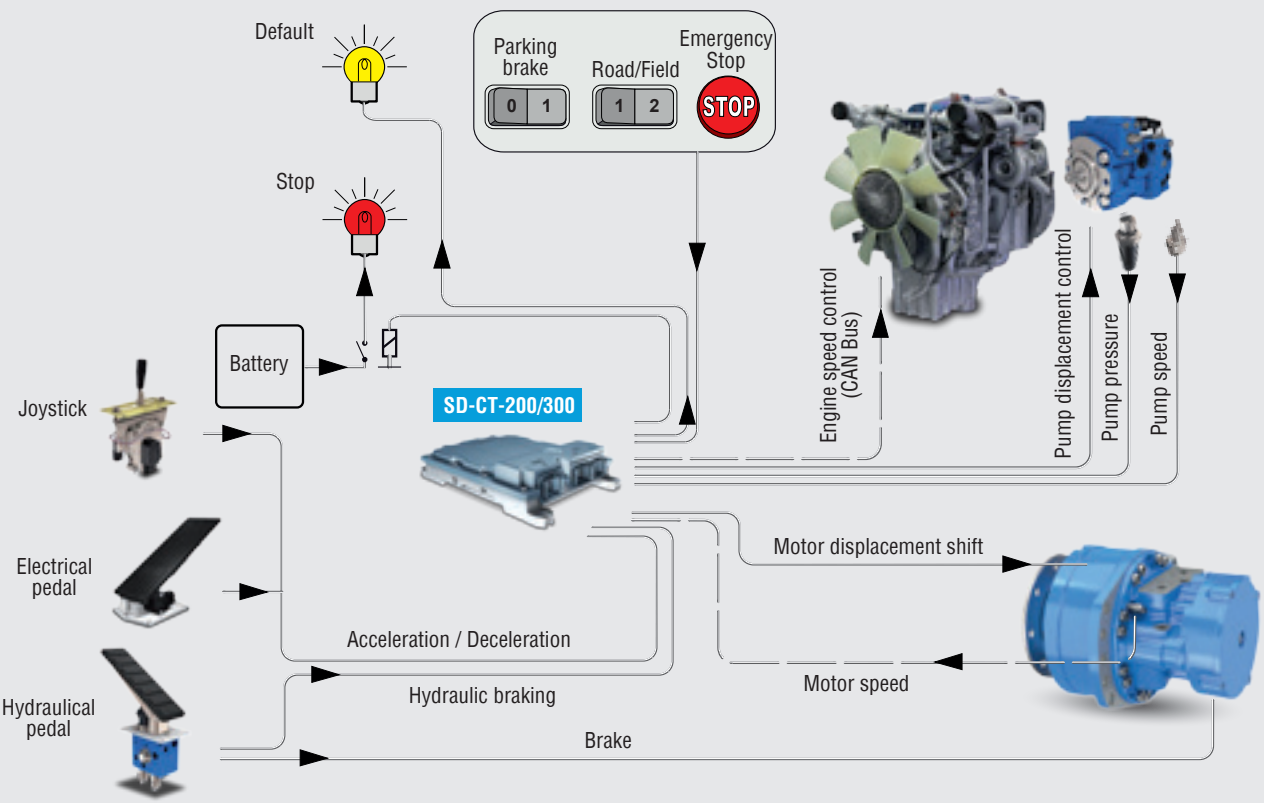
## SD-CT ECU characteristics

| | | SD-CT-200 | SD-CT-300 |
|---|---|---|---|
| **Power supply** | V | 8 to 32 | |
| **Max. current** | A | 35,4 | |
| **Protection** | | IP67 | |
| **Microprocessor** | bits | 32 + 8 | |
| **Inputs** | ANA | 11 | 17 |
| | FREQ | 5 | 8 |
| | UNIV | 9 | 15 |
| **Outputs** | STOR 2A | 4 | 4 |
| | STOR 2,6A | 0 | 4 |
| | PWM 2A | 6 | 8 |
| | LSD 4A | 0 | 3 |
| | LSD 5,2A | 3 | 3 |
| **Supply output** | 5V | 1 | |
| **Microcontroller** | | 2 | |
| **CAN Bus** | | 3 | |
| **Certification** | | E13 10R-04 12836 | |
| **Performance level** | | SIL2 level, Ag-PI-d<br>PI-d (ISO 13849:2006) capable | |
| **Operating temperature** | °C [°F] | -40 to 85 [-40 to 185] | |
| **Weight** | kg [lb] | 1,270 [2.76] | |
| **Dimension L x l x h** | mm [in] | 236,2 x 180,4 x 56 [9.30 x 7.10 x 2.20] | |



ELECTRONICS

## Example of hydrostatic transmission control



## SD-CT ECU embedded functions

| | |
|---|---|
| **PROTECTION**<br>Prevent failure of the hydrostatic transmission | Over pressure limitation |
| | Over power limitation |
| | Engine over speed limitation |
| | Over temperature |
| **PRODUCTIVITY**<br>Improve performance for increased productivity | Combine braking (dynamic + hydraulic) |
| | Anti-skid |
| | Travel / work mode |
| | Constant engine command for tools management |
| | 2 pumps management (tandem or independent) |
| | Difflock management |
| | Set wheel circonference by CAN |
| **SAFETY**<br>Ensure compliance with regulatory requirements | Safety start management |
| | Hill Start |
| | Automatic application of the parking brake |
| | Driver presence |
| | Brake lights |
| | Backing-up alarm (when going reverse) |

| | |
|---|---|
| **COMFORT**<br>Improve comfort for better productivity | Anti-stall |
| | Cruise control / Speed control loop |
| | Electronic inching |
| | Motor displacement automatic shifting |
| | Enhanced shifting |
| | Command limiter |
| | Display management |
| | CAN broadcasting |
| **ENVIRONMENT**<br>Reduce environmental impact | EcoDrive™ |
| | Smart Automotive / Hydraulic automotive like |
| **DRIVING ERGONOMICS** | Friction joystick |
| | Acceleration joystick (CAN or Wired) |
| | Travel pedal and joystick |



# ECODRIVE™

## Reduced consumption in work and road modes

The EcoDrive™ solution is applicable to all machines with an electronic pump control and internal combustion engine control by CAN Bus.
Completely automatic, the EcoDrive™ function requires no particular action from the driver and always selects the best combination of internal combustion engine speed and pump displacement.
Machines fitted with the EcoDrive™ function are therefore much more eco-friendly, with reduced fuel consumption, $CO_2$ emissions and noise impact.

More information > Page 132

## CT-SUITE: A single ecosystem to simplify your user experience

Poclain Hydraulics provides CT-SUITE, a suite of intelligent software that brings together all the tools needed to design and diagnose your electronically controlled hydrostatic transmission simply and quickly.

### CT-DESIGN

Generate your software without any skills in software programming.

### EBOM-BUILDER

Define easily the components you need to create your electronic circuits.

### PHASES-CT

Built your interface with the transmission software. You can adjust all the parameters and check the different status of the transmission over the time for the functionning of your machine.



## DOWNLOAD CT-SUITE

### Are you new here?

Feel free to create your account and ask for a license.

https://phases.poclain-hydraulics.com/downloadcenter/

### Are you an OEM representative?

Ask for your specific license and access and get your activation code.

https://phases.poclain-hydraulics.com/downloadcenter/

You can also flash this QR code

## CT-DESIGN: Design your own management software

CT-DESIGN is a very ergonomic and easy to use interface to configure the software you will need for your application.

### A Platform approach

The CT-DESIGN software offers functions especially created for target pumps and applications.

Propel Off-Road

AddiDrive

PMe pumps

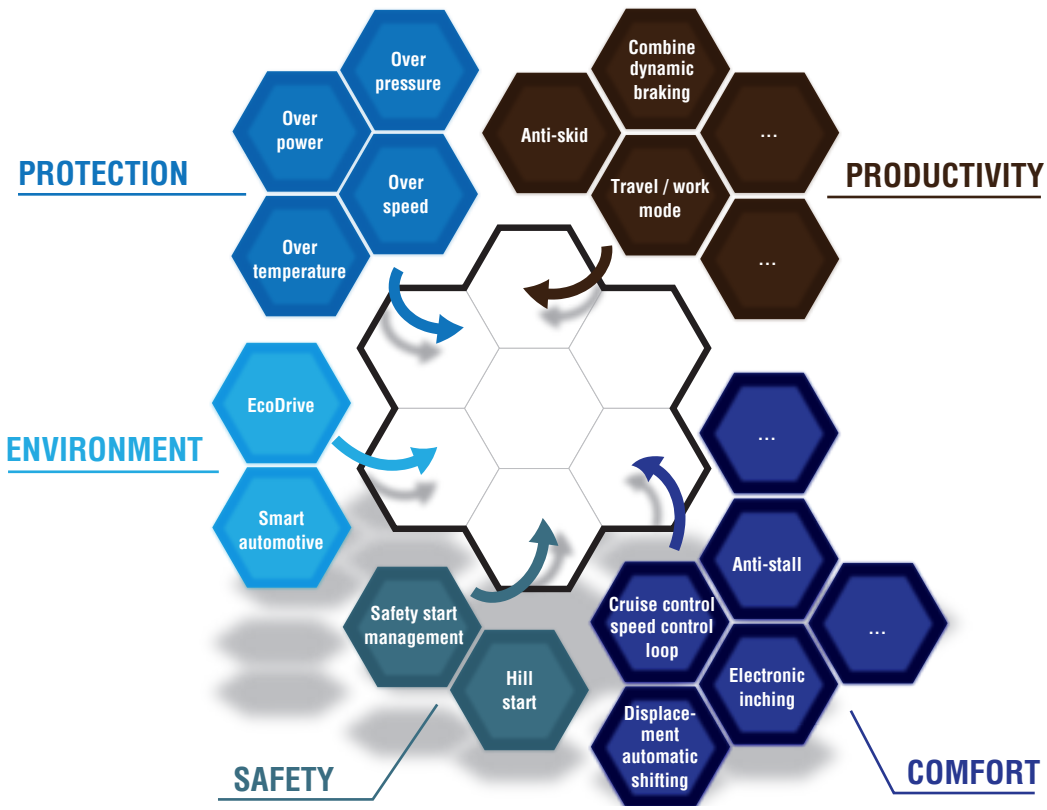
CreepDrive

Electromobility

### Functions ready-to-use

With the CT-DESIGN software, Poclain Hydraulics is making access to electronically controlled hydrostatic transmissions easier by allowing OEMs to create their own management software.

Thanks to a library of fully tested software functions, each customer using CT-DESIGN can, without any further help, combine the necessary functions to generate their software in just a few clicks, and reduce development time and costs.

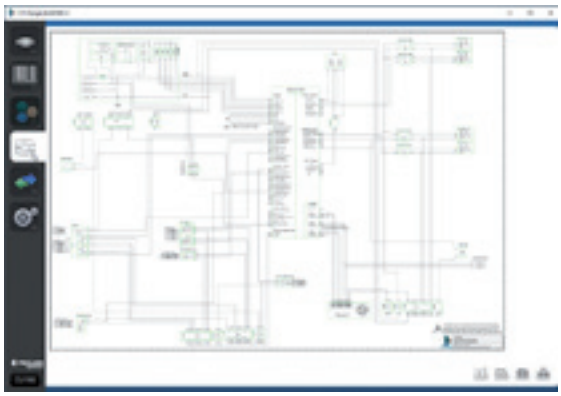


CT-DESIGN is a PC software that allows to design your dedicated software in four very simple steps. Starting from a list of generic functions, you can select which ones you would like to use for your application.
The generated software is then ready to use.

**❶ Choose your platform**

**❷ Create your embedded software by selecting the functions you need**

**❸ Generate automatically the electronic wiring diagram**



**❹ Generate and save your embedded software, the electrical diagram, the summary of functions and the specification of your software corresponding to the design created.**



## EBOM-BUILDER: Get the list of your electronic components

With EBOM BUILDER, the Poclain Hydraulics Application Engineer and the Electronic teams support you by proposing the electronic components that correspond to your needs.

**❶ Choose your Poclain Hydraulics electronic components**

**❷ Generate your Poclain Hydraulics electronic component list**

## PHASES-CT: Optimize and diagnose your hydrostatic transmission

Installed on a computer running a Windows OS and connected to a SD-CT 200/300 ECU via its USB/CAN-bus adapter, the PHASES-CT software can be used to carry out configuration, optimization and maintenance operations for the hydrostatic transmission systems in the best possible ergonomic conditions.

**In particular, it allows the user:**

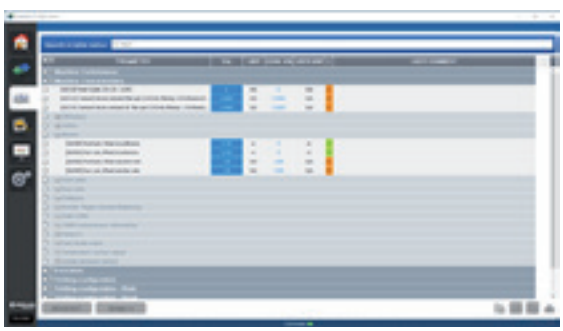
- to download the embedded software in the ECU
- to adjust and control the operating parameters of the ECU
- to calibrate and to check the operation of the sensors and driving devices connected to the ECU
- to diagnose the possible malfunctions of the hydrostatic transmission by displaying the error list

**Its main characteristics are:**

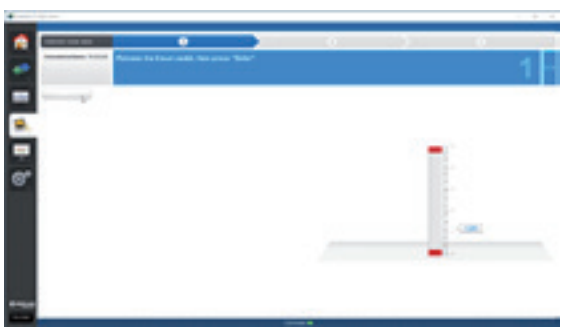
- a graphical interface, user friendly, multilingual and configurable
- the visualization of error messages
- direct access to software settings
- real-time monitoring of input and outputs values as well as their location on the ECU connectors
- real-time monitoring of 12 machine parameters simultaneously in a table or a graphic
- recording of monitoring curves

**❶ Download software embedded in the SD-CT-30/200/300 ECU**

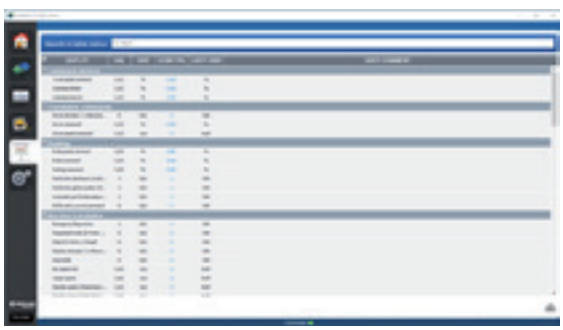
**❷ Adjust and control the parameters of your hydrostatic transmission**



**❸ Calibrate the various devices that drive your hydrostatic transmissions**



**❹ Diagnose your hydrostatic transmission**



**❺ Record and analyze the operating curves of your hydrostatic transmission**

# HARDWARES TO COMMAND AND CONTROL

## HYDROSTATIC TRANSMISSIONS

- Displays
- Pedals
- Joysticks
- Sensors

# ACTUATORS AND SENSORS


## Displays

Visualize the main data of the hydraulic transmission: speed, pressure, temperature, error messages and more with our displays.

| | | SD-DISPLAY-2.8-CR0451 | SD-DISPLAY-4.3-CR0452 |
|---|---|---|---|
| | | Color display, allowing to display the status of your hydraulic transmission or assistance.<br>9 keys to navigate and to change parameters values.<br>This display is delivered with an application software | Color display, allowing to display the status of your hydraulic transmission or assistance.<br>10 keys to navigate and to change parameters values.<br>This display is delivered without software (using Phases-CT for downloading) |
| **Display size** | | 2.8" | 4.3" |
| **Display type** | | LCD TFT color, 320 x 240 pixels | LCD TFT color, 480 x 272 pixels |
| **Power supply** | V | 8 to 32 | 8 to 32 |
| **Overvoltage** | V | 36 | 36 |
| **Current at 24V** | mA | 70 | 100 |
| **Operating temperature** | °C [°F] | -20 to +70 [-4 to +158] | -20 to +65 [-4 to +149] |
| **Weight** | g [lb] | 170 [0.37] | 220 [0.48] |
| **Max. dimensions** | mm [in] | 87,5 x 87,5 x 36,3 [3.44 x 3.44 x 1.42] | 124,5 x 109,5 x 39 [4.90 x 4.31 x 1.53] |
| **Protection** | | IP67 (Front) / IP65 (Back) | IP67 (Front) / IP65 (Back) |
| **CAN Bus** | | 1 (ISO11898, 2.0B) | 1 (ISO11898, 2.0B) |
| **Layer2, CANopen, J1939** | | Yes | Yes |

ELECTRONICS

## Joysticks

Provide the drive speed command

| | | Friction joystick with center lock | Friction joystick with Z gate* |
|---|---|---|---|
| | | Joystick with center lock | Hall effect joystick with two opposite analog signals and a neutral switch |
| **Power supply** | V | 5 | 5 |
| **Operating temperature** | °C [°F] | -25 to +70 [-13 to +158] | -40 to +80 [-40 to +176] |
| **Weight** | g [lb] | 560 [1.23] | 1 000 [2.20] |
| **Max. dimensions** | mm [in] | 189,1 x 82,5 x 60 [7.45 x 3.25 x 2.36] | 135 x 160 x 75 [5.31 x 6.30 x 2.95] |
| **Protection** | | IP65 | IP67 |

* Prepared for "add-on" multifunction grip.

## Pedals

Provide the drive speed command

| | | Floor pedal |
|---|---|---|
| | | Pedal with dual output signal.<br>Contactless sensor.<br>Travel and brake control. |
| **Power supply** | V | 5 |
| **Operating temperature** | °C [°F] | -40 to +85 [-40 to +185] |
| **Weight** | g [lb] | 960 [2.11] |
| **Max. dimensions** | mm [in] | 247 x 97 x 160 [9.72 x 3.82 x 6.30] |
| **Protection** | | IP66 |

## Sensors

| | | Pressure sensors | Speed sensors | High resolution speed sensors | Temperature sensors |
|---|---|---|---|---|---|
| | | Allows to measure the pressure in the high pressure circuit from 20 to 600 bar [290 to 8,702 PSI]. Use to limit pressure and power to control the torque. | Installed in the motor, it allows to get rotation speed and direction information. | Installed in the motor, it allows to get high rotation speed and direction information. | Allow to check oil temperature to avoid over temperature in the hydraulic circuit. Available in digital or analogic version. |
| **Measurement range** | | 40 bar [580 PSI]<br>160 bar [2,320 PSI]<br>600 bar [8,702 PSI] | 0 to 15 kHz | 0 to 30 kHz | -20 °C to +120 °C<br>[-4 °F to 248 °F] |
| **Output signal** | | Analog 0,5V to 4,5V ratiometric | Type : Push-Pull<br>T4 : One frequency signal<br>TD : Two shifted frequency signals<br>TR : One frequency and one direction signals | Type : Push-Pull<br>Two shifted frequency signals | Analog 0,5V to 4,5V ratiometric |
| **Power supply** | V | 5V ±5% | 8 to 32V | 9 to 32V | 5V ±5% |
| **Protection** | | IP67 / IP6K9K | IP67 / IP6K9K | IP6K9K | IP67 / IP6K9K |
| **Operating temperature** | °C [°F] | Ambient : -40°C to +105°C [-40 to +221] | -40 to +125 [-40 to +257] | -40 to +105 [-40 to +221] | Ambient: -40 to +100 [-40 to +212] |
| **Connector availables** | | DIN72585<br>Metripack 150<br>Deutsch DT04-3P | M12 connector<br>Deutsch DT04-4P | Deutsch DTM04-4P | M12 connector<br>DIN72585 |

# READY TO USE SOLUTIONS

# REFERENCE OFFERS

## SPEED UP YOUR MACHINE'S TIME TO MARKET

Poclain Hydraulics offers turnkey hydrostatic solutions for off- and on-road applications.

Our expertise enables us to understand your requirements and provide a precise solution for them.

By placing the design of your hydrostatic systems in our hands, you save design time and shorten your new machines' time to market.

The reference offers are available on Poclain Hydraulics web site and e-shop.

- **> Construction**
- **> Agricultural**
- **> Mining**
- **> Forestry**
- **> Environment**
- **> Material handling**
- **> Industry**
- **> Marine**
- **> On-Road**
- **> Etc**

# READY-TO-USE SOLUTIONS

Poclain Hydraulics offers ready-to-use hydrostatic solutions for off-road and on-road applications.

Our expertise in hydraulics, mechanics and electronics enables us to understand your needs and provide value to your customers.

## FULLY HYDROSTATIC ANTISKID

TWIN LOCK

p.126

## ELECTRONIC ANTISKID

SD-CT OFF-ROAD

p.128

## ON-DEMAND HYDROSTATIC ASSIST DRIVE

ASSIST DRIVE

p.130

## AUTOMATIC ENGINE RPM MANAGEMENT

ECODRIVE

p.132

By entrusting us with your hydrostatic systems, you will save development time and cost, paving the way for more efficient, productive and safe machines.

## BOOSTED HYDROSTATIC BRAKE

BOOSTED BRAKE

p.134

## DUAL LINE TRACTOR-TRAILER BRAKING

TRACTOR BRAKING

p.136

## ALL WHEEL DRIVE FOR TRUCKS

ADDIDRIVE

p.138

## CONSISTENT LOW SPEED DRIVE

CREEP DRIVE

p.140

## ELECTRIC MOBILITY

e+h

p.142

# FULLY HYDROSTATIC ANTISKID

## ENHANCE THE CROSSING CAPACITY OF YOUR MACHINES

- The TwinLock™ solution transfers the torque from the wheels that are slipping to the wheels with the greatest grip. It is the ideal compromise between a parallel circuit and a series circuit.
- This solution is applicable on all machines with at least three-wheel drive.

# TWINLOCK™

### Twin-Lock™ motors
The Twin-Lock™ solution is available from MS02 to MS50 and MHP20/27motors.

**More information**
**> Page 24**

### Hydraulic pump
With our wide range you will find the pump that meets the full needs of your application.

**More information**
**> Page 74**

### By-pass valve
This valve can be used to by-pass one half of a Twin-Lock ™ motor to create a two speeds machine.

KVC-3/2 (NG10)

**More information**
**> Page 86**

### Twin-Lock™ valve
Two valves are available in order to facilitate steering when Twin-Lock™ is used.

VDP
with a mechanical control

PR-TL-SV
with a hydraulic control

**More information**
**> Page 86**

## Ground protection
Avoid wheel slippage and damage to ground.

## Better productivity
Greater productivity of the machines due to better off-road performance.

## Proactive operation
Provide excellent responsiveness of the solution with instantaneous torque transfer from the wheel with poor grip to the wheel with strong grip.

## Reduced maintenance
Simplify maintenance with a 100% hydraulic solution requiring no electronic control.

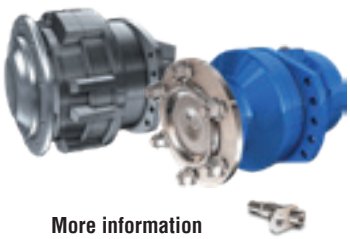
# AUTOMATIC ELECTRONIC ANTISKID
## ENHANCE THE TRACTION POTENTIAL OF YOUR MACHINES

- The speed sensors incorporated in the hydraulic motors continuously measure the rotation speed of each powered wheel. The ECU compares those speeds and if necessary reduces hydraulic flow to the wheel that is skidding thanks to the antiskidding valve.
- This solution is applicable on all machines with at least two drive wheel drive.

# SD-CT OFF-ROAD

### Hydraulic motors + Speed sensor

Any motor equipped with speed sensor or predisposition for speed sensor can be used.



**More information**
**> Page 11**

### Hydraulic pump

With our wide range you will find the pump that meets the full needs of your application.

**More information**
**> Page 74**

### Antiskidding VMA valve

It provides regulation of the input flow of the two motors on the same axle.

**More information**
**> Page 86**

### SD-CT ECU + Embedded software

The SD-CT ECU and its embedded software set-up, calibrates, controls and diagnoses the hydrostatic transmission.

**More information**
**> Page 108**

## Ground protection

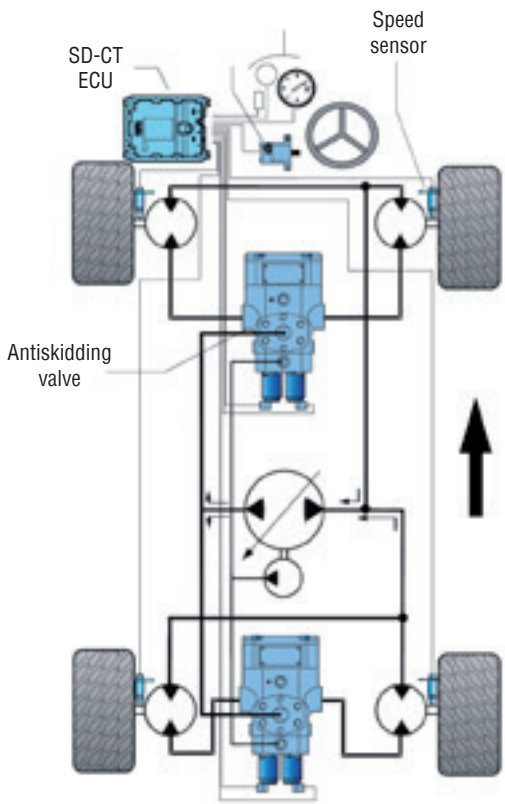
Avoid wheel slippage and damage to ground.

## Better productivity

Greater productivity of the machines due to better off-road performance.

## High flexibility

Excellent flexibility of the solution, effective torque transfer from the wheel with poor grip to the wheel with strong grip.



# ON-DEMAND HYDRAULIC TRANSMISSION
## FOR OFF-ROAD MACHINES

**Poclain Hydraulics offers an on-demand hydraulic transmission that provides the additional traction needed for working in difficult traction conditions like on muddy soil and/or on steep slopes. The system improves the machine's steerability on all soil conditions, bringing the best-in-class steering angle.**
**Poclain's hydraulic 4WD not only prevents the machines from getting stuck, but also helps users boost their productivity and decrease the TCO.**

# ASSIST DRIVE

### Hydraulic motor
With our wide range you will find the motor that meets the full needs of your application.

**More information**
**> Page 12**

### Variable displacement closed loop pumps
Any pump can be used for this solution.

**More information**
**> Page 76**

### Freewheeling valve VDF
Manages smoothly the engagement/disengagement sequences of the hydraulic motors.

We can also provide combo valve that includes in one block free wheeling and flow divider functions.

**More information**
**> Page 86**

## Easy integration
The solution is easy to integrate and compatible with a wide range of machines. The solution is based on free-wheeling technology inherent to Poclain motor technology (radial pistons) and mastered with more than 30 years of field experience.

## Low consumption
The 4WD is activated only when needed, without impacting fuel consumption when used in 2WD.

## Low maintenance
The solution reduces tire wear and prevents machine ground damage.

# AUTOMATIC ENGINE RPM MANAGEMENT

## REDUCED CONSUMPTION AND NOISE IMPACT

- The EcoDrive™ solution is applicable to all machines with an electronic pump control and internal combustion engine controlled by CAN Bus.
- Completely automatic, the EcoDrive™ function requires no particular action from the driver and always selects the best combination of engine speed and pump displacement.
- Machines fitted with the EcoDrive™ function are much more eco-friendly, with reduced fuel consumption, $CO_2$ emissions and noise impact.

GREEN HYDRAULIC SOLUTIONS

# ECODRIVE

### Hydraulic motor
With our wide range you will find the motor that meets the full needs of your application.

**More information**
**> Page 11**

### Hydraulic pump
Any pump equipped with an electrical control can be used for this solution.

## Green Machine
EcoDrive™ reduces fuel consuption up to 15%, effectively reducing $CO_2$ emission.

## Easy Machine
EcoDrive™ is totally automatic and allows the driver to keep his mind on the job.

## Quiet Machine
By reducing engine speed, EcoDrive™ reduces machine noise emission.

### SD-CT ECU + Embedded software
The ECU continuously receives the engine load information through CAN bus and adapts the engine speed and the pump displacement to achieve the lowest possible rpm while meeting the load and power requirements.
Actual engine power always matches engine power required by machine operation.

**More information**
**> Page 110**

# BOOSTED HYDRAULIC BRAKE
## MORE SAFETY FOR YOUR MACHINES

- Boosted Brake™ offers increased hydrostatic braking capabilities. It meets regulation requirements in terms of braking distances, while reducing dynamic brake usage and minimizing engine loading.
- Applicable to all machines subject to high and/or repeated deceleration, both on the road and in the field, Boosted Braking™ is especially recommended for machines with a low engine braking capability.

# BOOSTED BRAKE

**Hydraulic motor**
MHP 11 to 27, MS18-E18 and MS35 can be equipped with Boosted Braking function.

**More information**
**> Page 11**

**Hydraulic pump**
Any pump equipped with an electrical control can be used for this solution.

## More braking capacity

Reduces braking distances in road mode and off-road mode.

## Lower maintenance costs

It preserves (or limits use of) friction brakes and requires no maintenance.

## More engine protection

Saves engines from over-speed. It maintains hydrostatic braking capability even for Tier IV / Stage 4 engines with poor load retaining capability. Maintenance operations are therefore less frequent.

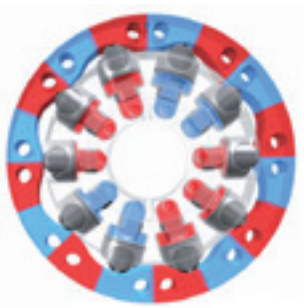
## Easy integration

The solution is integrated into the hydraulic motors without any extra piping.

A simple spool is integrated into the motor

**Motor without Boosted Brake**
Half of the hydrostatic braking torque is used when the motor is in half displacement.

**Motor with Boosted Brake**
All the hydrostatic braking torque is used even if the motor is in half displacement.



# GET THE MOST OUT YOUR BRAKING SYSTEM
## FOR TRACTORS AND TRAILERS

- **Poclain Hydraulics smart components meet the EU2015/68 regulation requirements and help you get the most of your braking system:**

  - Simplify product stock, improve performance and ergonomics with software parameters rather than hardware

  - Think outside of the box with potential additional functions such as « hill Start » and « jackknifing » prevention

DESIGNED FOR EU2015/68

# DUAL LINE TRACTOR-TRAILER BRAKING

### Tractor steering assist brake valve

- Four wheel braked tractor
- Automatic connection right/left

**More information**
**> Page 103**

### Tractor parking/emergency brake valve

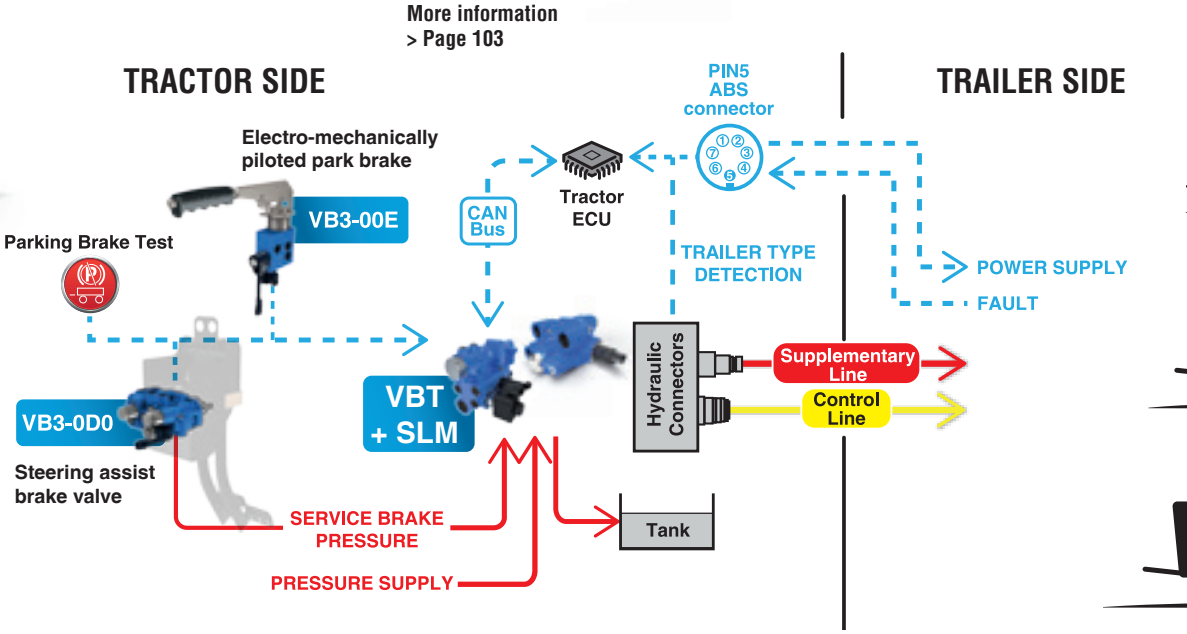
- Parking brake modulating valve
- Park lock option

**More information**
**> Page 100**

### Dual line trailer brake valve

- A single control line valve (VBT) across your range of tractors
- A single architecture to cover every used or new trailer (single line, dual line, CUNA)
- Designed for UTAC certification
- Leakage detection on the control line and leakage stop
- Enhanced park brake test function
- Automatic re-fill of the trailer accumulator each time the tractor stops

**More information**
**> Page 103**




READY TO USE SOLUTIONS

# PIONEERING ALL-WHEEL-DRIVE SOLUTION

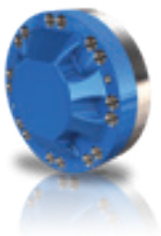
## GO ANYWHERE WHATEVER THE WEATHER

- Pioneering All-Wheel-Drive solution combining the best of off-road and on-road worlds
- Already adopted by various truck manufacturers
- Suits all types of trucks
- Integral solution reducing development time
- Peace of mind thanks to higher efficiency

# ADDIDRIVE

## Two architectures to choose: Closed or Open Loop

### MF Hydraulic motor
Fitted on the front wheels, the MF motors provide traction or retaining torque as needed.



**More information**
**> Page 66**

### SD-CT200 ECU + Embedded software
The ECU manages communication and additional functions.

- Automotive standards / IP67 Protection / PI-d / SIL2.
- Compatible with the CAN truck network.

**More information**
**> Page 108**

### Variable Pump
Powered by the engine or the gearbox PTO, the pump generates and provides hydraulic power to the MF motors.

### Control valves
The control valves ensure the safety and management of the activation, release and free-wheeling of MF motors.

**- Addiflow™ valve for closed loop**

**- Directional & LS management valves for open loop**

## Performance
- Increased payload capacity compared to a mechanical all-wheel drive truck
- Easier to drive over obstacles with or without load
- Allows for closer approach to work site
- The boost at start function helps the truck to start in difficult conditions, in forward and reverse directions, without forcing the clutch
- Limited impact on fuel consumption compared to a standard truck

## Safety and reliability
- No risk of getting stuck due to traction loss thanks to the transfer of the rear torque to the front
- Automatic disengagement at 30 kph [18.6 mph]
- Better maneuverability thanks to traction on the main axle when driving around corners and in the event of poor traction when driving in a straight line
- Adapted to extreme temperatures from -40°C to +40°C [-40°F to +104°F]

## Comfort
- Easy access to the driver's cabin, with all the comfort of a standard truck
- Lower center of gravity to improve driver comfort
- Enhanced turning radius compared to a standard truck or mechanical all-wheel drive
- Stable truck and trailer coupling

## Versatile
- Compatible with all truck brands and models
- Compatible with the existing trailer fleet
- Enables one truck to be used for various tasks

# CONSISTENT LOW SPEED DRIVE

## FOR UP TO 44T (97,000LB) TRUCKS WORKING AT UP TO 12KPH (7,5MPH)

- Hybrid mechanical-hydraulic transmission for vehicles that travel at normal speed and work at low speed.
- Allows vehicles to work at very low constant speed in both forward and reverse.
- When the system is disengaged, the vehicle is able to drive at normal on-road speed with no additional losses.

# CREEPDRIVE

### CDM motor
Provides torque to the main driveshaft.

**More information**
**> Page 70**

### Variable Displacement PM Pump
Powered by the engine or the gearbox PTO, the PM pump generates and provides hydraulic power to the CDM motor.

**More information**
**> Page 76**

### Exchange valve VE60
Allows to deflect a part of oil to the cooling system.

**More information**
**> Page 92**

### KVC3/2 piloting valve
Pilots the speeds change (automatic shifting managed by ECU - SmartDrive).

**More information**
**> Page 90**

### SD-CT-300 ECU & Embedded Software
The ECU manages communication and additional functions.

**More information**
**> Page 108**

### CreepDrive electronic kit:
- The electronic kit includes the ECU SmartDrive, the joystick, the display with “stop and start buttons”, and needed cables and connectors to facilitate the integration into customer’s dashboard.
- The CreepDrive electronic kit is compatible with pumps with electroproportional control with mechanical feedback.

## Versatile
- Fits wide range of trucks
- Use the same vehicle for both work and travel mode
- Compatible with both: manual and automatic gearbox
- Compatible with diesel, gasoline and LNG

## Easy integration
- Simple design, easy to install and mount on the chassis
- No impact on original truck kinematics
- No impact on chassis stifness

## Simple maintenance
- Reduces brakes, clutch and transmission wearing
- No need for specific maintenance: the maintenance is done simultaneously with mechanical transmission’s maintenance.

## Improved work quality
- Simple system use allows the driver to concentrate on auxiliary functions, rather than maintaining the constant speed
- Independent of the engine speed: allowing all engine power for auxiliary systems to perform work effectively
- Low noise level, thanks compatibility with low engine rpm

# THE ELECTRIC MOBILITY SOLUTION
## FOR YOUR ZERO EMISSION COMPACT MACHINES

**Poclain is accelerating the world's electrification thanks to its new e+h platform.
This versatile electrification solution helps OEMs fast-track the development and time to market of zero emission off-highway equipment projects.**

### OEMs BENEFITS

- Identical performances compared to ICE version
- Accelerated time to market. Your zero emission vehicle in less than 12 month
- High ruggedness from time-proven hydrostatic transmission
- Peace of mind thanks to a complete engineering services package
- Reduced development costs
- Reduced industrial investment
- Lower supply chain and aftersales costs

### END USER BENEFITS

- Reduced total cost of ownership
- Zero emission
- Reduced vibration
- Reduced noise emission level
- Access to restricted areas
- Low maintenance
- Connected services & fleet management

# e+h SOLUTION

e+h is the flexible and efficient electrification solution built for OEMs to develop their electric off-highway machines. It is combining advanced engineering services with a versatile system platform.

e+h multi-disciplinary engineering team, with expertise in electrical & hydraulic ecosystems will help you manage your electrification project, from duty cycle assessmenet, through system design including functionnal safety till complete commissionning

e+h solution has been specifically designed for compact machines below 30 kW.

**System platform** + **Engineering services**

zero emission

## The e+h system

e+h is a versatile low voltage system for both machine transmission and power distribution to auxiliaries whether in one or two e-motors configuration.

The hybrid e+h system is comprised of rugged hydraulic components based on cam-lobe in-wheel technology and state-of-the-art electric, power electronics and electronic components combined with an advanced embedded control software.

The machine integration, highly critical on compact equipment, is strongly optimized thanks to the in-wheel ultra-compact configuration. e+h transmissions operate 4-quadrants thus optimizing vehicule range thanks to regenerative braking.

### ELECTRICAL COMPONENTS

#### ME1-S-48 IPM e-motor

- Max torque/Max. power: 70 N.m/10 kW, 90 N.m/18 kW, 120 N.m/27 kW

#### emDrive L30 DC/AC inverter

- Nominal voltage 48 VDC
- 2 minute RMS current rating: 350 A, 450 A, 600 A

#### SD-CT ECU & Software

To store the embedded control software for “e+h” power management (transmission and auxiliaries).

**More information > Page 110**

#### DC/DC converter

- Nominal voltage 48 VDC
- Output voltage 12 VDC
- Nominal power 500 W

#### On-Board Charger

- Input voltage 200 VAC
- Output voltage 48 VDC
- Nominal power 3 kW

### HYDRAULICAL COMPONENTS

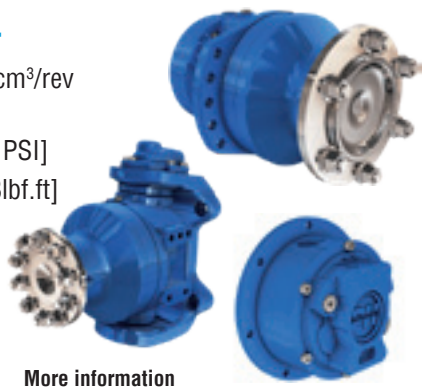
#### Drive pump

- Fixed or variable displacement
- Displacement range: 7-35 cm³/rev [0.43-2.13 cu.in/rev]
- Max. pressure 400 bar [5,801 PSI]

**More information > Page 76**

#### MS, MG or MK Hydraulic motor

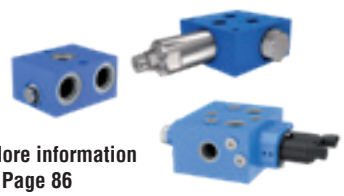
- Displacement range: 172-750 cm³/rev [10.5-45.7 cu.in/rev]
- Max. pressure: 450 bar [6,526 PSI]
- Max. torque: 4 770 N.m [3,518lbf.ft]
- Max. power: 29 kW [39 HP]
- Max. speed: 590 rpm
- With or without brake



**More information > Page 12**

#### Motion control valves

- VE30 hot oil shuttle valve
- SP110 serial circuit protection valve



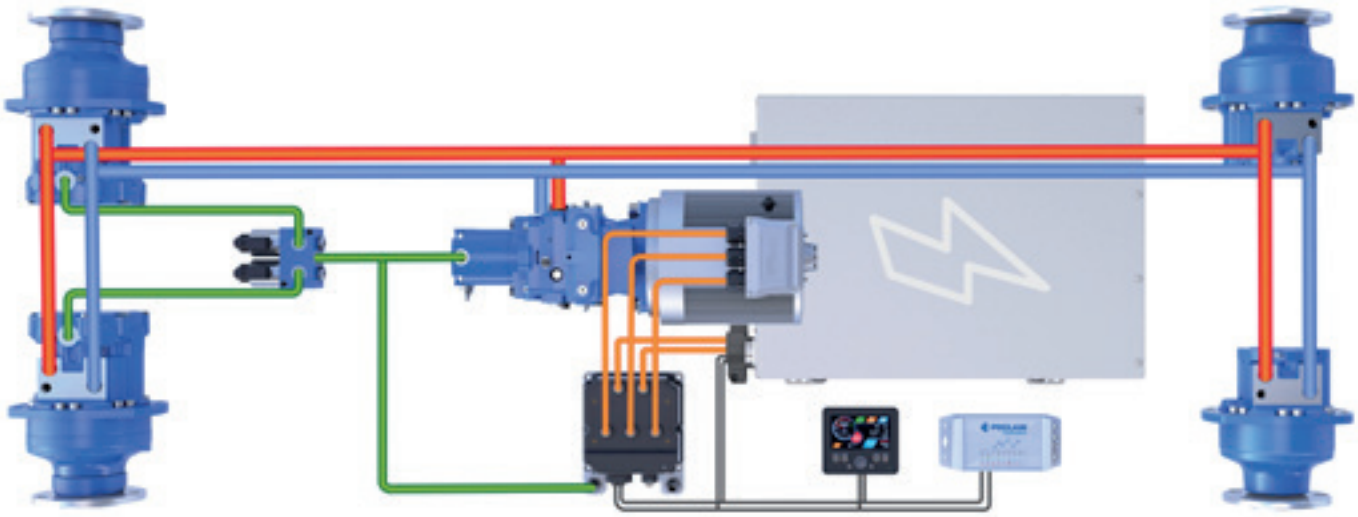
**More information > Page 86**

#### Sensors

- Temperature sensor
- Pressure sensor

**More information > Page 116**

### Example of electro-hydraulic layout with one e-motor



## e+h single motor: best cost to performance

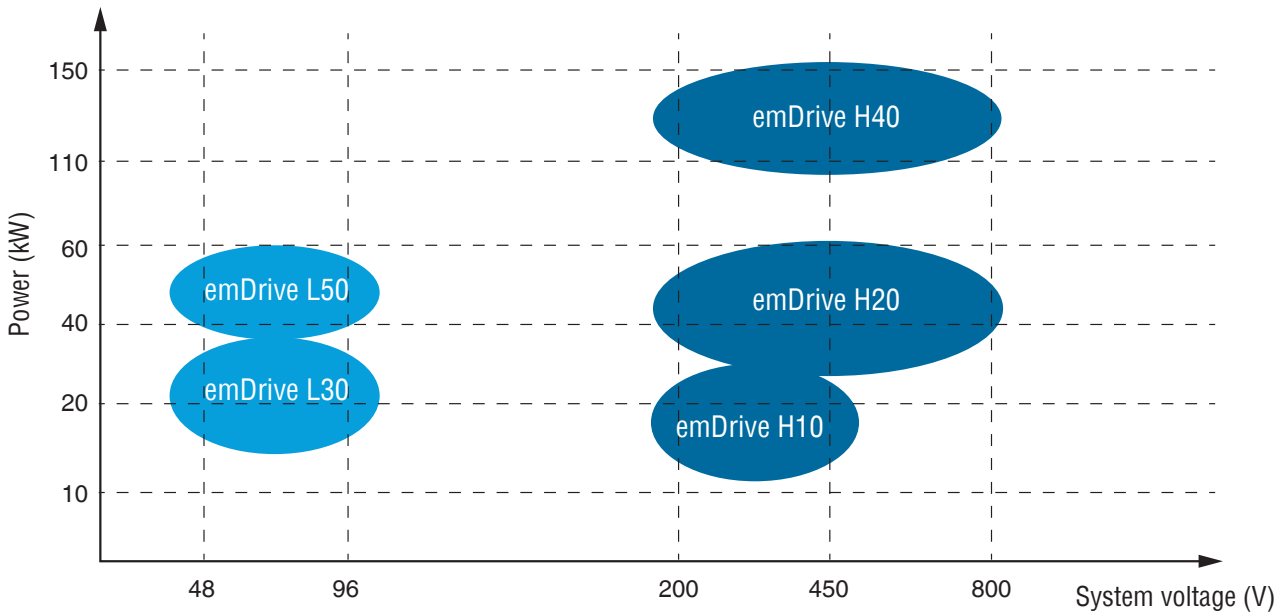
- Simplify architecture
- Cost efficient: one e-motor, inverter as vehicle ECU
- Poclain exclusive safe braking control insured in all conditions

## e+h dual motor: optimized efficiency

- Optimize efficience thanks to improved energy management between drive and auxiliaries
- Poclain exclusive safe braking control insured in all conditions

## The emDrive DC/AC inverter range

Thanks to more than 10 years of experience in inverter design and our modular platform, we continue to develop our power range to meet off-highway market needs. Don't hesitate to contact us to discuss your application!




### Advanced FOC control with the highest power density

- Field orirneted control in all 4 quadrants with space vector modulation (SVPWM) or discontinuous pulse width modulation (DPWM)
- Motor type: PMSM, BLDC, IPM
- Best in class continuous vs peak current in its volume thanks to advanced semiconductor management and actively cooled capacitors

### High efficiency, even at high speed and in high dynamics app

- Deep field weakening and operation in MTPV region
- Multi-dimensional mapping of the motor available as a option

### Best maintenance cost and machine availability

- Optimized inverter reliability
- eMotor protection – Over current and thermal protection
- Battery protection – Over current protection and over and under absolute voltage protection
- Rugged for your application – IP65 or higher

### Program and run your application without additional ECU

- Dedicated applicative core runs application written in LUA or runs your Matlab designed applications

### Meet your functional safety requirements

- Functional safe dedicated microprocessor core running in lock step and validated safe functions
- Modular functional safety platform distributed through the entire power range

### Simple inverter configuration to adapt to application needs

- Powerful tool for configuration and real-time data acquisition of any CANopen device
- Access to all inverter parameters with access level option
- Real time data acquisition and visualization from multi-devices
- … and many more

### Full reusability of your application code

- emDrives are based on a common modular software platform

### Compatible with various motor rotor sensor technology

- Encoder, resolver or sine/cosine sensors
- For rugged design differential sine/cosine sensor can be used

### For low voltage, liquid or air cooled

## emDrive DC/AC Inverter characteristics





| | | emDrive L30 450_60 | EmDrive L30 300_120 | emDrive L50** 500_120 | emDrive H10 100_450 | emDrive H20 200_450 | emDrive H20 150_800 | emDriveH40 450_450 | emDriveH40 300_800 |
|---|---|---|---|---|---|---|---|---|---|
| **Motor type** | | PMSM, IPM, BLDC | | | | | | | |
| **Nominal DC voltage** | V | 48 | 96 | 96 | 360 | 360 | 680 | 360 | 680 |
| **Rated current S2 - 1 min** | Arms | 650 | 600 | 800 | 150 | 300 | 200-250* | 600 | 400-450* |
| **Rated current S2 - 60 min** | Arms | 450 | 300 | 500 | 100 | 200 | 100-150* | 450 | 250-300* |
| **Dimensions liquid cooled** | mm [in] | 91 x 165 x 200 [4.09 x 6.5 x 7.87] | | 78 x 310 x 205 [3.07 x 12.2 x 8.07] | 70 x 200 x 105 [2.76 x 7.87 x 4.13] | 103,5 x 280,5 x 282,5 [4.07 x 11.04 x 11.12] | | 104 x 295 x 385 [4.09 x 11.61 x 15.16] | |
| **Cooling option** | | Air or liquid | | | | Liquid | | | |

*Depends on modulation type and switching frequency.
**Preliminary

## The e+h engineering service pack

e+h offers a comprehensive set of value added engineering services designed to enable OEMs to effectively develop their electric machine, from the initial project requirements to the serial production of the machines.

### Direct online duty cycle analysis

Learn about machines' duty cycles via our web platform.

### Expert report on machine operation

Make the right decisions based on detailed analysis.

### Component selection and sizing

Make the best technical choices

### System simulation

Assess and optimize the system performance.

### Embedded software specification and development

Refine your specifications with our experts and recieve the corresponding validated application software.

### Support to system functional safety assessment

Confirm the fonctionnal safety of your application thanks to our system assesment.

### Support to system integration

Ease and guarantee your prototyping.

### Prototype connected commissioning

First start-up, test and prototype monitoring.

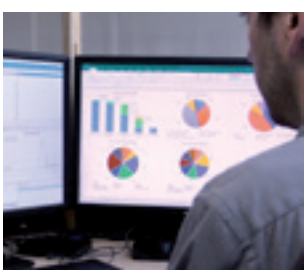
### Test track rental

Test your vehicles on Poclain's test track.

### Customer trainings

From the basics to the commissioning of a machine.

**More information**
**> Page 150**

# SERVICES

# POCLAIN HYDRAULICS SERVICES

## MAKING YOUR LIFE EASIER

Poclain Hydraulics is a partner you can rely on to accompany you with the design and sizing of your hydrostatic or electrohydraulic transmission.

Whatever your expertise in hydraulic or transmissions, whatever your application, we offer you level of 60 years of experience at all stages of your machine's lifetime. From design to after-sales, we guarantee the highest level of quality throughout our collaboration.

**> Specific studies, support for customers' projects & new developments**

**> Connected services: collect and alayse machines' operation data**

**> Prototyping and tuning a new machine**

**> Testing prototypes and vehicles**

**> Software development and customization**

**> System delivery for a complete transmission**

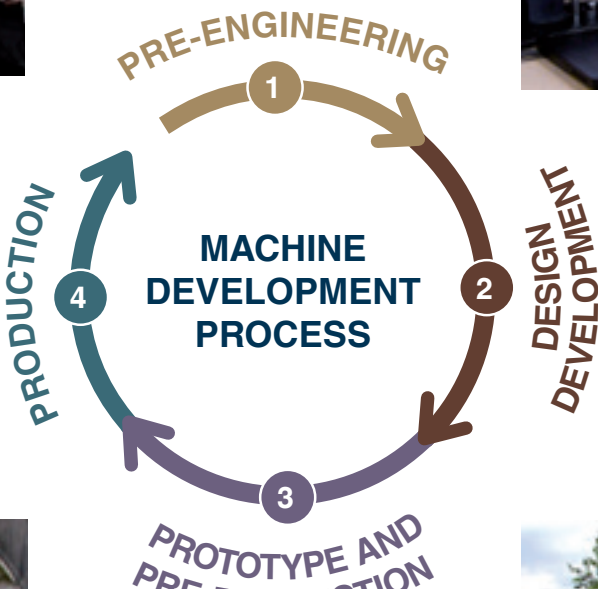
**> Trainings**

**> Certified Repair Centers and spare parts delivery**

**YOUR TRANSMISSION WILL PERFORM AT AN OPTIMUM LEVEL**

**TIME TO MARKET AND TECHNICAL RISKS ARE REDUCED**

# WE ACCOMPANY YOU THROUGHOUT THE LIFECYCLE OF YOUR MACHINES






# CONNECTED ENGINEERING

## CONNECTED SERVICES FOR DATA-BASED MACHINE DEVELOPEMENT

In a constantly evolving world, where customer expectations are becoming increasingly demanding, it is imperative to push beyond conventional limits to design machines capable of meeting modern challenges.

Today, the key to this transformation lies in a deep understanding of machine operational data. These provide invaluable insights into the usage, performance, and requirements of industrial equipment. By harnessing this data, you can engineer tailored solutions that precisely address your clients' specific needs, while achieving significant advancements in consumption reduction and usage optimization.

**With Connected Engineering services, commencing with a precise analysis of machine duty cycles, you gain access to a profound understanding of operational data, now indispensable to remain at the forefront of industrial innovation.**

# DIRECT ONLINE DUTY CYCLE ANALYSIS

## ACCESS OUR WEB PLATFORM AND PROVIDE YOUR ENGINEERING TEAMS THE KEY DATA TO DESIGN THE MACHINES BEST ADAPTED TO THE NEEDS OF YOUR CUSTOMERS AND MARKETS

### 1

**Connect representative machines in the field with the Poclain's Databox…**

### 2

**…and get the key data and duty cycles via our online web platform**


## THE ADVANTAGES

### DATA FUEL INNOVATION AND PRODUCT DESIGN

- Learn from the machines today, anticipate tomorrow's projects
- Get reliable data as inputs for your future developments
- Focus on user's needs and adopt "design to usage" approach

### ENHANCE YOUR ENGINEERING CAPABILITIES

- Speed up and simplify the connection of machines
- Start to learn as soon as machines are connected
- Access processed data directly and stay focused on your core business: developing high-quality machines

### BENEFIT FROM ADVANCED EXPERTISE

- Poclain's expertise is based on a deep understanding of machines and applications
- Draw on Poclain's experience to develop the knowledge of your technical teams

# EXPERT REPORT ON MACHINE OPERATION

## MAKE THE RIGHT DECISIONS BASED ON THE DETAILED ANALYSIS OF THE MACHINE'S OPERATION CONDUCTED BY POCLAIN EXPERTS

**1**

**From the existing raw data of the machine…**

**2**

**…obtain a detailed report focused on your specific engineering needs**

## THE ADVANTAGES

### GATHER ALL THE INPUTS YOU NEED TO LAUNCH YOUR STRATEGIC PROJECTS

- Deepen understanding of machine operation through in-depth data analysis
- Focus on the key knowledge needed to launch and lead new developments
- Ensure you have the right inputs to maximize your chances of success

### AIM FOR A SUCCESSFUL PROTOTYPE RIGHT FROM THE START

- Whatever your objectives – electrification, downsizing, design to usage… – you make the best technical choices
- Avoid development loops and reduce time to market

### RELY ON POCLAIN'S DATA SCIENCE AND ENGINEERING TEAMS

- Fast data analysis thanks to automated tools and processes
- Benefit from the experience of specialists in hydraulics and electrification to make the right decisions more quickly

# CONNECTED COMMISSIONING

## ENSURE YOUR NEW MACHINE MEETS EXPECTATIONS FOR MASS PRODUCTION

**1**

**Connect your prototype and pre-production machines with the Poclain's Databox…**

**2**

**…and get machines status, performance, and reliability via our online web platform**

Data Explorer

Status analysis

## THE ADVANTAGES

### ACCELERATE AND SECURE THE TRANSITION FROM PROTOTYPE TO MASS PRODUCTION

- Monitor machines operation and performance in actual working conditions
- Confirm the sizing and reliability of specific components
- Adjust machine parameters, validate results in the field via the web platform

### FASTER PROBLEM SOLVING

- Be directly informed in case of problem on a machine
- Access to the data to perform initial diagnostics
- Take the right corrective actions more quickly, avoid contamination to the fleet

### PUT ALL THE CHANCES ON YOUR SIDE TO SUCCESSFULLY LAUNCH YOUR NEW MACHINE

- You have confirmed that the new machine meets your expectations and the needs of your customers
- All parameters are green for the start of mass production

# PRO-MONITORING

## DATA AT THE SERVICE OF MACHINE PRODUCTIVITY

The PRO-Monitoring solution, developed with our partner SAMSYS, is an intelligent platform designed to convert machine data into usable knowledge, and thus enable OEMs and end-users to optimize the daily work of the machines:

- Improve machine maintenance and uptime
- Facilitate daily work and use of equipment
- Enhance productivity

Initially developed for agricultural applications and meeting the specific needs of this sector of activity, the PRO-Monitoring service offering is also intended to adapt to other mobile applications.


SAMSYS®

POCLAIN

# GAIN MAINTENANCE EFFICIENCY
# BOOST MACHINE PRODUCTIVITY

## MACHINE MANAGEMENT

### ELEVATE THE LEVEL OF YOUR AFTERMARKET SERVICE

- Monitor alerts and errors on machines in real time.
- React swiftly and conduct remote diagnostics based on the machine data
- Travel on-site only when necessary, reduce costs and optimize machine uptime

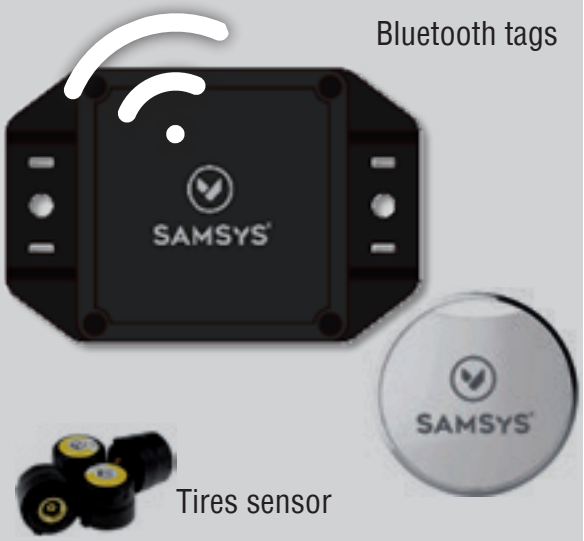
## FLEET AND ACTIVITY MANAGEMENT

### EXPAND YOUR OFFERING TO END-USERS

- Simplify and enhance the utilization and operation of machinery in the fields
- End-users can identify and track their machinery, monitor field activities, and generate automated reports. Let the machines speak!
- Solution already adopted by many end-users

## A PLATFORM DEDICATED TO AGRICULTURAL APPLICATIONS

- Equipment localization, automatic detection and visualization of activities, precise measurement of treated areas, management of materials and drivers, reports...
- Specific options are also available, such as centimetric RTK positioning, Bluetooth tags for tools and drivers or pressure sensors for tires.



# SYSTEM SIMULATION
## FROM COMPONENT TO MACHINE

In an increasingly competitive and regulated environment, deeper machine optimization studies can be a decisive step in becoming more competitive and better meeting market requirements.

Poclain Hydraulics theoretical sizing tools are well suited in many cases, but there is a growing interest in more in-depth studies. This is the case when downsizing diesel engines, which is often necessary to satisfy stricter pollution standards, or machine electrification.

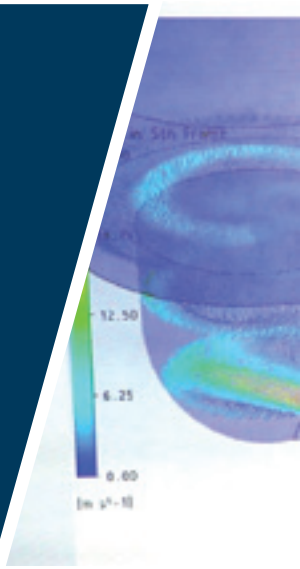
**SYSTEM SIMULATION HELPS ADDRESS OPTIMIZATION NEEDS AND ANTICIPATES RISKS IN ADVANCED PROTOTYPING PHASES.**

Simulation is a powerful tool for optimizing the machine performance, as it takes into account the specific system characteristics such as efficiencies, control strategies and hoses, as well as external elements such as the internal combustion engine, auxiliary consumption, tire data and ground adherence.

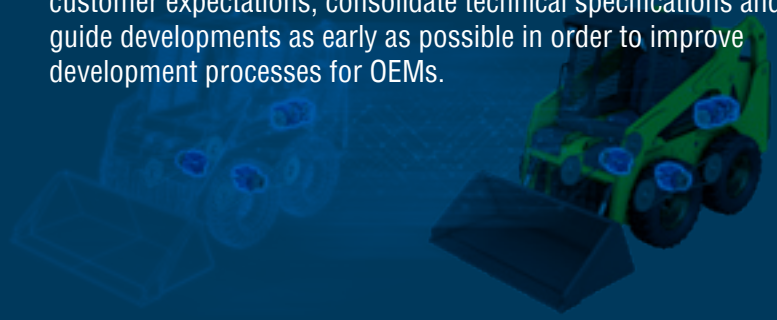
The machine behavior is analyzed according to specific scenarios and maneuvers, and results can be weighted over realistic operating cycles. We are then able to evaluate how each component of the system contributes to overall energy consumption, responsiveness, performance and driving comfort as well as their impact on the thermal behavior of the transmission.

**BY CONFIRMING THE PERFORMANCE RESULTING FROM THE DESIGN CHOICES, WE CAN FOCUS DEVELOPMENT EFFORTS ON THE MOST RELEVANT ELEMENTS.**

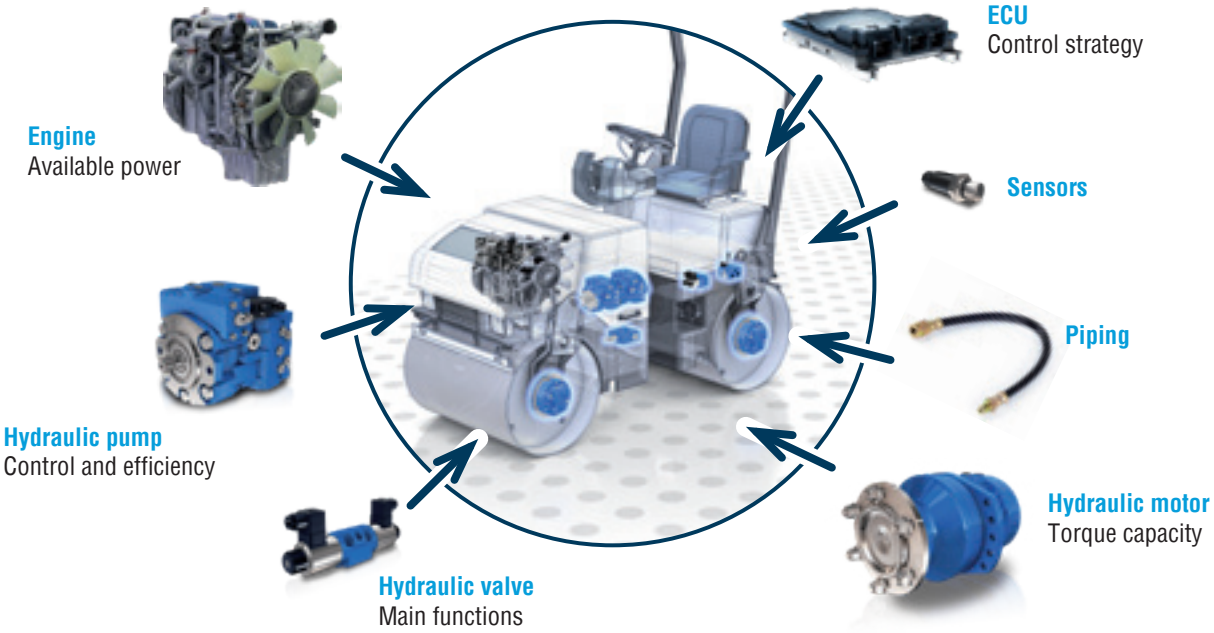
Simulation and virtual commissioning make it possible to anticipate customer expectations, consolidate technical specifications and guide developments as early as possible in order to improve development processes for OEMs.







# ASSESSING THE SYSTEM PERFORMANCE




## MAIN STEPS OF THE SYSTEM SIMULATION PROCESS

1. Identify deliverables and means to be implemented
2. Collect required data, detailed calculations and construct associated system models
3. Carry out the first simulations
4. Identify points of vigilance and areas for improvement. Optimization proposals and confirmation that we are in line with the initial request
5. Assessment of alternative solutions and recommendations based on the obtained results
6. Issue a report summarizing the initial requirements, the procedure, the assumptions made and the results of the simulations.

# 3D INTEGRATION SERVICE

## TO EASE AND GUARANTEE YOUR PROTOTYPING

Whether for an industrial or a mobile application, most new projects call for prototyping. Carried out on-site by a field technician, it often requires craftmanship and time to integrate the components into their environment.

With the 3D integration service, Poclain Hydraulics brings you support and expertise to ease and guarantee a prototype according to your expectations, while reducing development time.

### INTEGRATION STUDY BASED ON THE MACHINE 3D DIGITAL ENVIRONMENT

Poclain Hydraulics steps up prototyping with a handheld 3D scanner to instantly capture machine geometry, and by studying component and system integration in the digital environment.

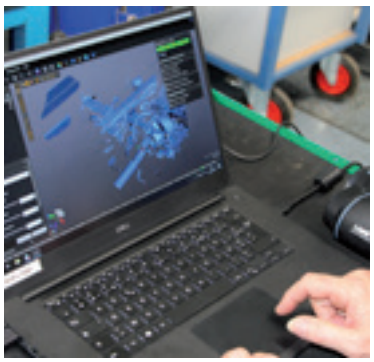
- Digitalization process managed by a Poclain Hydraulics technician specifically trained in scanning complex environments and 3D files post-processing software.
- Quick, precise, flexible and no contact process.
- Scanning can take place anywhere the machine is located, the machine does not need to travel.
- Instant capture of the geometry of the machine, even in areas where measurement is difficult or impossible.
- Functional elements' identification for accurate measurements, geometric evaluations and system integration studies.
- Component or full system integration study in the digital environment, with recommendations for proptotype production.

**THIS FLEXIBLE DIGITALIZATION PROCESS HELPS YOU TO ANTICIPATE DIFFICULTIES AND GEOMETRY DEFAULTS BEFORE PROTOTYPING ON THE MACHINE. YOU CAN SAVE TIME BY REDUCING THE DELAY OF PRODUCING A RELIABLE PROTOTYPE, AND STAY FOCUSED ON YOUR CORE BUSINESS.**

# 3 LEVELS OF SERVICES

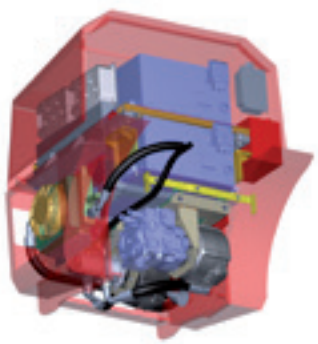
## 1 3D scan of the machine environment

- Scan of the machine to generate the 3D digital environment.
- Creation of reference surfaces to identify the functional elements.
- 3D files delivered ready to be used for component or system integration study.



## 2 Components integration step

- Component integration study in the digital environment, taking machine real architecture into account.
- Anticipate difficulties before prototyping.
- Report with recommendations delivered to support prototyping and resolve integration interferences.



## 3 Full system integration proposal

- Component and system integration study in the digital environment.
- Poclain hydraulics expertise, from clarifying integration interferences up to full system integration.
- Report with technical recommendations delivered for prototype production support.

# TEST TRACK RENTAL

## MANAGE VEHICULE TESTING IN FULL AUTONOMY ON POCLAIN'S TEST TRACK

In the process of developing a vehicle, specific tests and scenarios are often necessary in order to qualify the machines or to prepare for a future homologation.
As a leader in hydrostatic transmissions, Poclain Hydraulics has equipped itself with a mobility area for on-road and off-road vehicles, which allows us conduct tests in optimal conditions that are adapted to the applications we serve.
This track, located at our Verberie site in France, close to Paris Charles de Gaulle Airport, can be made available to you exclusively, as part of a development project or independently, in order to allow you to test your vehicles.

### ON-ROAD, OFF-ROAD, SLOPES AND WORKING AREAS

Our test track is suitable for both on-road and off-road vehicle testing. Some areas are also reserved for work situation simulation.


# A COMPLETE OFFER TO FULFILL YOUR VEHICLE TESTING NEEDS

## STANDARD PACKAGE

**In order to ensure that the tests run in good conditions, equipment and our support are at your disposal:**

- Exclusive use of the test track
- Hangar for vehicle parking and protection
- Sprinkler system on areas needing to be watered
- Support with test session organization
- Punctual support during the test session (towing a vehicle, punctual advice to conduct the tests)
- First level mechanical assistance in Poclain Hydraulics workshop
- Ballasts for vehicle load

## EXTENDED SERVICES

**Depending on your needs, we are able to propose additional services to facilitate running tests or result analysis:**

- Poclain Hydraulics assistance throughout the duration of the tests
- Connected Engineering : data acquisition and analysis
- Training on hydraulics
- Demo or training on vehicle driving
- Assistance for unloading and loading vehicles
- Refueling vehicles during tests
- Video shooting during tests
- Lunch service

**We are at your disposal to study any other request that you may have in the context of the organization of your tests on our track.**

# CERTIFIED TRAINING CENTER

## FROM THE BASICS OF HYDRAULICS TO THE COMMISSIONING OF A MACHINE

Poclain Hydraulics specializes in the design, manufacture and marketing of hydrostatic transmissions.

Our world-leading expertise enables us to provide customers with innovative solutions including hydraulic motors, pumps, valves and electronics that enhance vehicle performance, energy savings and safety.

In this high level technological environment, developing and maintaining the skills of your people is a must. With Poclain Hydraulics Training Center (PHTC), we are perfectly qualified to provide high-level trainings to our customers and partners, from the basics of hydraulics to the commissioning of a machine.
We also offer tailor-made and personalized training courses that meet specific customers' needs.

The courses are available face-to-face on site in your premises or in the various PHTC. They are also provided remotely via webinars.



Our priority is the satisfaction of the people we train.
As a token of our engagement, our Training Center has been certified with the French National Quality Certification Standard QUALIOPI, and our trainers are certified by the Federation of Professional Training.

Qualiopi
processus certifié
RÉPUBLIQUE FRANÇAISE
La certification qualité a été délivrée au titre de la catégorie d'action suivante :
ACTIONS DE FORMATION

**QUESTIONS OR TRAINING NEEDS?**

**PHTC_Contact@poclain.com**

# TRAINING COURSES THAT ADAPT TO YOUR NEEDS

PHTC
POCLAIN HYDRAULICS TRAINING CENTER

## Products and systems

- Products and system overview
- Hydrostatic transmission awareness

## From the fundamentals to the fine-tuning of hydraulic system

- Hydraulics & electronics fundamentals
- Pump, motor, valve & electronics offering
- Hydraulic circuits on mobile applications
- Sizing essentials: how to size a hydrostatic transmission
- Focus on solutions: swing drive, assistance & anti-skid, Twin-Lock…
- Fine tune a system: open lop circuit, Twin-Lock…

## Assemble, install, repair

- Motor repair
- Start-up a machine
- Hydraulic symbols and circuits understanding

# GLOBAL COMPANY
## LOCAL SUPPORT

Our certified repair processes meet our demanding quality, safety and environment standards. Our network of 9 internal and 34 external Certified Repair Centers (CRC) cover all the main countries where our customers need local services.

To support customer service, our network relies on our after-sales department, which regularly distributes documentation about new products, updates existing brochures and supports the network via our product expert hotline (motors, pumps, valves and systems). We also offer reman replacement programs, express repairs and preventive maintenance programs.

Our after-sales customer logistics agents, located in all our subsidiaries, manage requests for original spare parts, which are distributed from our logistics platforms in the United States, Europe and Asia, to ensure the best customer satisfaction. Quotes are sent within 24 hours and we can arrange express delivery if required.

# 43 CERTIFIED REPAIR CENTERS

- Inspection
- Repairs and Tests
- Flash Repairs
- Spare Parts Sales
- Hot Line
- Technical Expertises
- After-Sales Training
- Repair Documentation


**More information**

To find the nearest Certified Repair Center go to our dedicated web page

SERVICES

# *A WORLDWIDE* SALES NETWORK

## More than 200 distributors in the world

**More information**

To find the nearest distributor visit our web page

## Poclain Hydraulics global sales locations

### CHINA
POCLAIN HYDRAULICS T&CT (BEIJING) CO, LTD
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Quanshitiandi Plaza
No. A50 Wangjing West Road
Chaoyang District
Beijing, Post code: 100102
Tel.: +86.10.64.38.66.18

POCLAIN HYDRAULICS (SHANGAI) CO, LTD
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Shanghai 201611
Tel: +86 21 37 00 34 15

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01300 Vantaa

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