Type V80M

Variable displacement axial piston pump

Product documentation

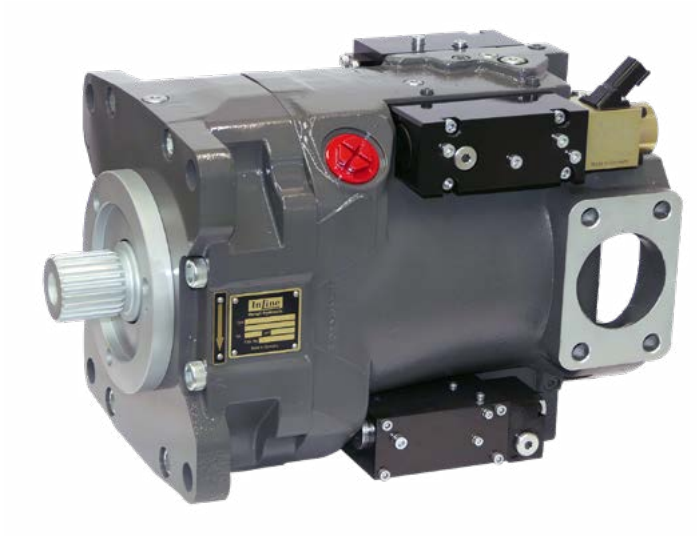
2020-04-01

Open circuit

Nominal pressure $p_{nom\ max}$: 400 bar

Peak pressure p_{max}: 450 bar

Geometric displacement V_{max}: 202 cm^3/rev



V80ML-200

Contents

1 Overview: variable displacement axial piston pump types V80M

Variable displacement axial piston pumps adjust the geometric delivery volume from maximum to zero. As a result they vary the volumetric flow that is provided to the loads.

The axial piston pump type V80M is designed for open circuits according to the swash plate principle. It is available with the option of a thru-shaft for operating additional hydraulic pumps in series.

The sturdy pump is particularly suitable for continuous operation in challenging applications. The range of pump controllers allows the axial piston pump to be used in a variety of applications.

Features and benefits:

- With charge pump, higher speed
- High nominal pressure
- Less installation space
- Full torque available at the second pump in tandem pump applications

Intended applications:

- Coal mining
- Concrete pump
- Extruder
- Industrial plants
- Marine cranes and winches
- Pile driving machine
- Power pack assembly
- Presses
- Tunnel boring machine

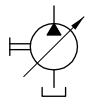
Type V80M

Variable displacement axial piston pump

2 Available versions, main data

2.1 Basic version

Circuit symbol:



Order coding example:

V80M	L	-200	R	S	F	N	-1	-0	-XX	/LSN	-2/190	-400	C311	-Z05

2. pump

Flange version
Table 9: Flange versions (output side)

Pressure specification (bar)

Stroke limitation
Table 7a: Stroke limitation

Controller
Table 8: Controllers;

Release
Release

Additional function
Table 7: Additional functions

Housing version
Table 6: Housing version

Seal
Table 5: Seals

Flange version
Table 4: Flange version (input side)

Shaft version
Table 3: Shaft version

Rotating direction
Table 2: Rotating direction

Nominal size
Table 1: Nominal size

With charge pump

Basic type

2.1 Basic version

Table 1: Nominal size

Coding	Geometric displacement (cm^3/rev.)	Nominal pressure P_{nom} (bar)	Peak pressure P_{max} (bar)
200	202	400	450

Table 2: Rotating directions

Coding	Description
L	Anti-clockwise
R	Clockwise

Table 3: Shaft versions

Coding	Description	Designation/Standard	Max. drive torque (Nm)
D	Spline shaft	W50×2×24×9g DIN 5480	2550
S	Spline shaft	SAE-F J 744 50-4 15T 8/16 DP ISO 3019-1	2350
U	Spline shaft	SAE-D J 744 44-4 13T 8/16 DP ISO 3019-1	1200

Table 4: Flange versions (input side)

Coding	Description	Designation
G	Flange	180 B4 HW ISO 3019-2
F	Flange	SAE-E 4-hole J 744 165-4 ISO 3019-1
W	Flange	SAE-D 4-hole J 744 152-4 ISO 3019-1

Table 5: Seals

Coding	Description
N	NBR
V	FKM

Table 6: Housing versions

Coding	Description
1	No thru-shaft
2	Thru-shaft

2.1 Basic version

Table 7: Additional functions, pivoting angle indicator

Coding	Description
0	None
1	With indicator
2	With pivoting angle pick-up (Hall sensor)

Table 7a: Stroke limitation

Coding	Description
2	Stroke limitation adjustable (Factory setting: 202 cm^3/rev)
2/...	Stroke limitation fixed with specification of the set geometric displacement V_g (cm^3/rev)

Table 8: Controller

Coding			Description	
-... P -			Pressure controller with adjustable pressure on the integrated pilot valve and port for external pilot valve. The pressure controller automatically maintains a constant system pressure independently of the required delivery flow. Therefore, it is suited to constant pressure systems where differing delivery flows are required or for efficient pressure limitation of a hydraulic system.	
-... Pb -			Coding Pb with external feedback of the pump pressure to compensate for a pressure loss in the pump pressure line.	
-... LSP			Load-sensing controller with pressure limitation. Stand-by pressure adjustable from 15 ... 35 bar. Default differential pressure setting: 27 bar	
-... LSPb			Coding LSPb with external feedback of the pump pressure to compensate for a pressure loss in the pump pressure line.	
- PMVPS 4	**- 41** **- 42** **- 43**	**/G 12** **/G 24**	Pressure range -41: (5) ... 180 bar -42: (5) ... 290 bar -43: (5) ... 440 bar **G ..**: Solenoid voltage	Additional, directly mounted proportional pressure-limiting valve for setpoint adjustment for the pressure controller (nominal voltage 12V DC or 24V DC with specification of the relevant max. pressure range). Can be combined with all controllers listed above. Valve type PMVPS 4 is used in accordance with D 7485/1 . Retrofitting is possible at any time.
- BVPM 1	**S** **R**	**/G 12** **/G 24**	**S**: Energised closed (deenergised open) **R**: Energised open (deenergised closed)	Additional, directly mounted 2/2-way directional seated valve for pump direction switching (nominal pressure/ stand-by pressure)

2.1 Basic version

Table 8: Controller

Coding	Description
-... L	The power controller with exact hyperbolic curve is used in the case of greatly varying pressures where the drive motor must also be protected against overloading. The drive torque is limited along the line "Pressure×Geometric displacement = Constant" by the special structure. If, for example, the pressure doubles at constant rotation speed, the delivery flow is automatically halved. External mechanical adjustment can be made to the drive torque at any time. Only in combination with pressure controller P, flow control V or load-sensing controller LSP. . **Order coding example:** V80M-200 RDFN - 0 - 1 - XX / **LP** - 300 V80M-200 RDFN - 1 - 1 - XX / **LLSP** / 120 - 200 - C 211
-... V	The controller V is used to control flow or speed in electronic or computer controlled systems. The V controller consists of a proportional solenoid acting on a servo valve that determines the position of the pump setting piston. The displacement of the pump is proportional to the current through the 24V DC solenoid (about 200-700 mA). In order to minimize valve hysteresis, a pulse width modulated control signal of approx. 80-100 Hz frequency is recommended.
-... EM.CH	The electro-hydraulic delivery flow controller adjusts the displacement volume of the pump between "zero" and "maximum" in proportion to an electrical input signal, (target 0 ... 10 V or 0 ... 20 mA). The power for the adjustment is taken from the high-pressure line. For system pressures below 50 bar, an additional auxiliary pump is required (thru-shaft). The control system consists of the pump adjustment system, an NG 6 prop. directional valve and a pivoting angle pick-up (coding 2) for actual value determination. Control electronics (coding CH, type DAC-4) compare the setpoint and actual values and supply the solenoid valves with the appropriate current. The control electronics used offer a wide range of options for individual adaptation, such as ramps and setpoint recall. Note: The adjustment times are approx. 200 ms. The adjustment can be combined with pressure controllers (coding P, PMVPS) and/or power controllers (coding L) to limit pressure and/or power. Note: In addition, a separately assigned overpressure protection (pressure-limiting valve) is also to be provided in the hydraulic circuit to avoid pressure peaks. **Order coding example:** V80M-200 RDFN - 2 - 2-XX / **EMPCH** - 250 - C312 - Z 02-6 (version with pressure limitation) V80M-200 RDFN - 2 - 2-XX / **EMLSPCH** / 1800 - 350 - C312 - Z 02-11 (version with load-sensing controller) V80M-200 RDFN - 2 - 2-XX / **EM0CH** - C322 - Z 02-9 (version without pressure limitation)

2.1 Basic version

Order coding example:

V80M	-200	R	S	F	N	-1	-0	-00	/LSN	-2	-400	C313

Table 9: Flange versions (output side)

Coding V80M	Coding V80ML	Flange	Shaft	e.g. mounting of InLine pump with coding
200	**200**			
C 311	**C 311L**	SAE-A 2-hole J 744 82-2 ISO 3019-1	SAE-A J 744 (16-4 ISO 3019-1) 9T 16/32 DP	
C 312	**C 312L**	SAE-A 2-hole J 744 82-2 ISO 3019-1	SAE-A J 744 (16-4 ISO 3019-1) 9T 16/32 DP [1)]	
C 313	**C 313L**	SAE-A 2-hole J 744 82-2 ISO 3019-1	19-4 ISO 3019-1 11T 16/32 DP	
C 314	**C 314L**	SAE-B 2-hole J 744 101-2 ISO 3019-1	SAE-B J 744 (22-4 ISO 3019-1) 13T 16/32 DP	V60N-060 .. HX
C 315	**C 315L**	SAE-B 4-hole J 744 101-4 ISO 3019-1	SAE-B J 744 (22-4 ISO 3019-1) 13T 16/32 DP	V60N-060 .. HZ
C 316	**C 316L**	SAE-B 2/4-hole 101-2/4 ISO 3019-1	SAE-BB J 744 (25-4 ISO 3019-1) 15T 16/32 DP	
C 317	**C 317L**	SAE-C 2-hole J 744 127-2 ISO 3019-1	SAE-C J 744 (32-4 ISO 3019-1) 14T 12/24 DP	
C 318	**C 318L**	SAE-C 4-hole J 744 127-4 ISO 3019-1	SAE-C J 744 (32-4 ISO 3019-1) 14T 12/24 DP	V60N- .. SF
C 319	**C 319L**	SAE-C 4-hole J 744 127-4 ISO 3019-1	23T 16/32 DP	
C 320	**C 320L**	SAE-D 4-hole J 744 152-4 ISO 3019-1	SAE-D&E J 744 (44-4 ISO 3019-1) 13T 8/16 DP	V30E-095 ..SF.. /V30E-160 ..SF.. /V80M-200 ..UW..
C 321	**C 321L**	SAE-E 4-hole J 744 165-4 ISO 3019-1	15T 8/16 DP	V80M-200 ..SF..
C 322	**C 322L**	Prepared for thru-shaft (cover)		
C 323	**C 323L**	160 B4 HW ISO 3019-2	W45×2×21×9g DIN 5480	
C 324	**C 324L**	SAE-D 4-hole J 744 152-4 ISO 3019-1	W45×2×21×9g DIN 5480	
C 326	**C 326L**	180 B4 HW ISO 3019-2	W50×2×24×9g DIN 5480	
C 329	**C 329L**	SAE-D 4-hole J 744 152-4 ISO 3019-1	W50×2×24×9g DIN 5480	
C 330	**C 330L**	SAE-E 4-hole J 744 165-4 ISO 3019-1	W50×2×24×9g DIN 5480	

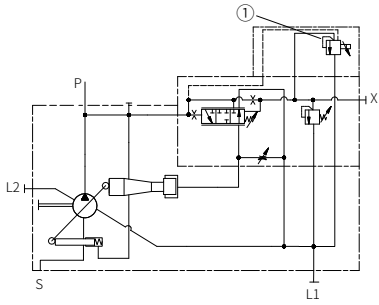
[1)] ANSI B 92.1, FLAT ROOT SIDE FIT, spline width deviating from the standard, s = 2.357-0.03

Note:
Pay attention to the maximum permissible drive torque, as the flange or shaft may be damaged otherwise.

Note:
An additional support is to be provided for pump combinations. Other versions on request.

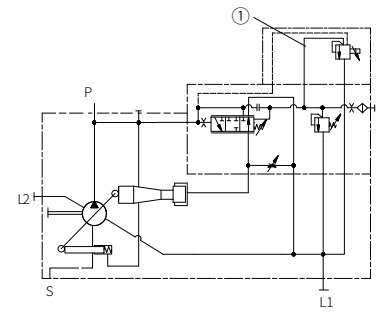
2.2 Controller switching symbols

Coding P



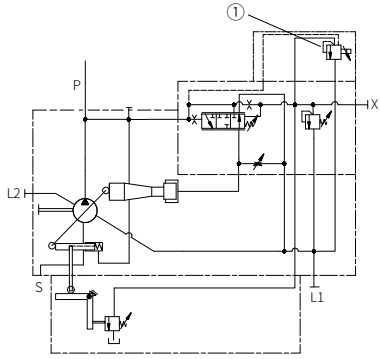
L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
X	Load sensing port G 1/4

Coding LSP



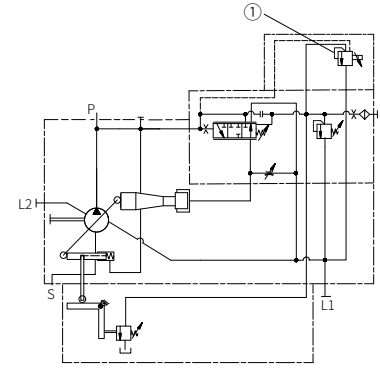
L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
LS	Load sensing port G 1/4

Coding LP



L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
X	Pilot port G 1/4

Coding LLSP

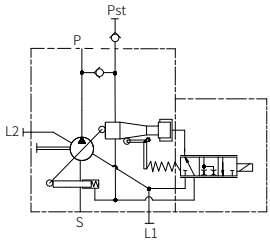


L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
LS	Load sensing port G 1/4

① Optional prop. pressure-limiting valve type PMVPS or type BVPM

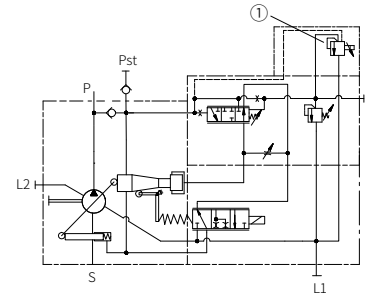
2.2 Controller switching symbols

Coding V



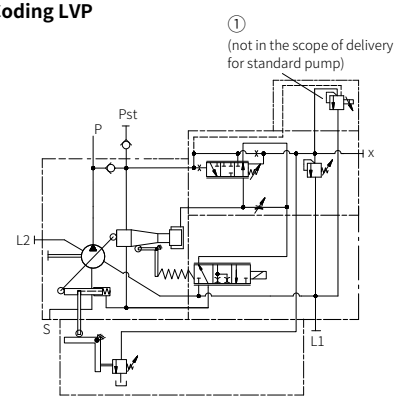
L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
Pst	Servo pressure port G 1/ 4

Coding VP



L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
Pst	Servo pressure port G 1/ 4
X	Pilot port G 1/ 4

Coding LVP

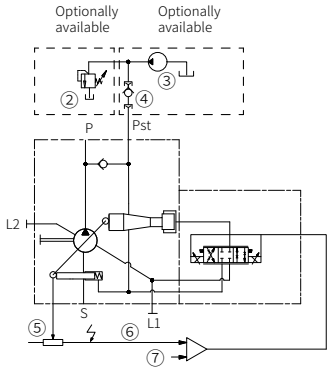


L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
Pst	Servo pressure port G 1/ 4
X	Pilot port G 1/ 4

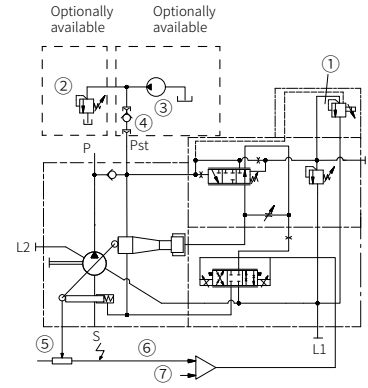
① Optional prop. pressure-limiting valve type PMVPS or type BVPM

2.2 Controller switching symbols

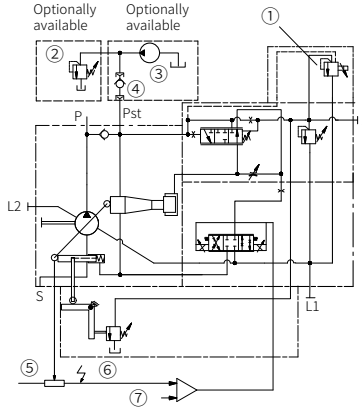
Coding EMOCH



Coding EMPCH



Coding EMLPCH



L1, L2	Drain ports G 1
S	Suction port
P	Pressure port
Pst	Servo pressure port G 1/ 4 (external feeding Port)
X	Pilot port G 1/ 4

① Optional prop. pressure-limiting valve type PMVPS or type BVPM
② Pressure relief valve 40...60Bar
③ Servo pump (app. 5% of pump displacement)
④ Piping check valve
⑤ Swash angle sensor
⑥ Feedback signal
⑦ Input signal

3 Parameters

3.1 General

Description	Variable displacement axial piston pump
Design	Axial piston pump according to the swash plate principle
Mounting	Flange mounting or foot bracket
Surface	Temporarily protected
Drive/output torque	See Chapter 3, "Parameters", under "Additional parameters"
Installation position	Any (for installation information see Chapter 5, "Installation information")
Rotating direction	Clockwise or anti-clockwise
Ports	· Suction port · Pressure port · Drain port · Pressure gauge connection
Hydraulic fluid	Hydraulic oil: according to DIN 51 524 Part 1 to 3; ISO VG 10 to 68 according to DIN 51 519 Viscosity range: min. approx. 10; max. approx. 1000 mm^2/s Optimal operating range: 16 to 35mm^2/s, when lower than 16mm^2, please contact InLine Hydraulik. Also suitable for biologically degradable pressure fluids type HEPG (polyalkalene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C . HFC pressure fluids (water glycol), note installation information in Chapter 5, "Installation information".
Purity class	19/17/14, ISO 4406
Temperatures	Ambient: approx. -40 to +60°C , oil: -25 to +80°C , pay attention to the viscosity range! Start temperature: down to -40°C is permissible (observe start-viscosity!), as long as the steady-state temperature is at least 20K higher for subsequent operation. Biologically degradable pressure fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C .

3.1 General

Pressure and delivery flow

Operating pressure	See Chapter 2, "Available versions, main data"
Geometric displacement	See Chapter 2, "Available versions, main data"

Weight

Coding	Without controller (kg)	With controller (kg)			
		LSP, P, Pb, LSPb	**L**	**V**	**EM.CH**
V80M-200	93	+3	+3.3	+3.5	+6.1
V80ML-200	105	+3	+3.3	+3.5	+6.1

Additional parameters

Description	Nominal size
	200
Max. swash plate angle	16°
Min. inlet pressure (absolute) open circuit	0.85 bar
Minimum operating pressure	15 bar
Max. permissible housing pressure (static/dynamic)	2 bar/ 3 bar
Max. permissible inlet pressure (static/dynamic)	20 bar/ 30 bar
Max. rotation speed during suction operation and max. swash plate angle at 1 bar abs. Inlet pressure	2150 rpm
Speed of with charge pump	2550 rpm
Max. rotation speed in supply mode	2500 rpm
Min. rotation speed in continuous operation	500 rpm
Required drive torque at 100 bar	350 Nm
Drive power at 250 bar and 1450 rpm	133 kW
Inertia torque	0.0825 kg m^2
Noise level at 250 bar, 1450 rpm and max. swash plate angle (measured in acoustic measurement chamber according to DIN ISO 4412, measurement distance 1m)	75 dB(A)

Note:
The minimum operating pressure in the pump line depends on the speed and the pivoting angle; the pressure must not fall below 15 bar under any circumstances.

Note:
The housing pressure is only allowed to be 1 bar higher than the suction pressure.

3.1 General

Max. permissible drive/output torque

Description		Nominal size
		200
Spline shaft D	Drive/output	2550 Nm/1800 Nm
Spline shaft S	Drive/output	2350 Nm/1800 Nm
Spline shaft U	Drive/output	1200 Nm/1200 Nm

3.2 Planning information for parameters

Determination of nominal sizes

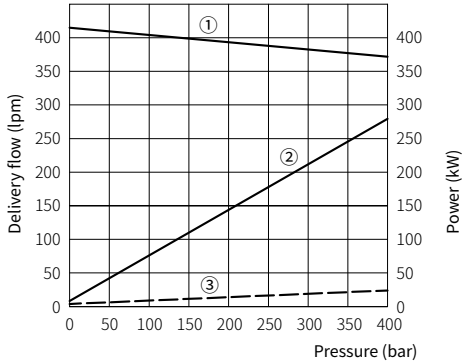
Delivery flow	$Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$ (lpm)	V_g	= Geom. output volume (cm^3/rev.)
		Δp	= Differential pressure
Drive torque	$M = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$ (Nm)	n	= Rotation speed (rpm)
		η_V	= Volumetric efficiency
Drive power	$P = \frac{2\pi \cdot M \cdot n}{60000} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t}$ (kw)	η_{mh}	= Mechanical-hydraulic efficiency
		η_t	= Overall efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

3.3 Characteristic curves

Delivery flow and power (basic pump)

The diagrams illustrate the delivery flow/pressure (without controller).
Drive power at max. swash plate angle and 1500 rpm.
Drive power/pressure at zero stroke and 1500 rpm.

Type V80M-200

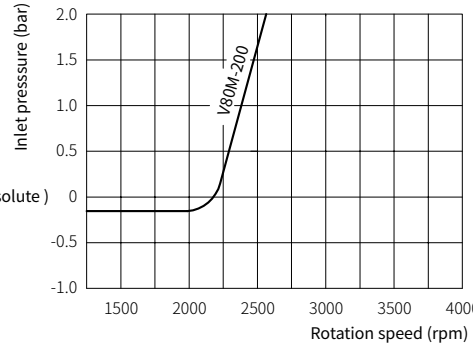


① Delivery flow/pressure
② Drive power/pressure
③ Drive power/pressure (zero stroke)

Inlet pressure and self-suction speed

The diagrams show the inlet pressure/speed at the max. swash plate angle and an oil viscosity of 75 mm^2/s.

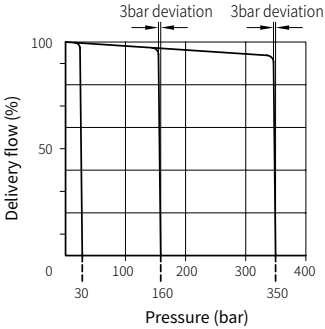
(0 bar relative = 1 bar absolute)

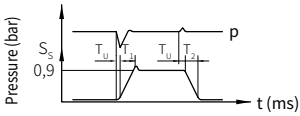


3.4 Controller characteristic curves

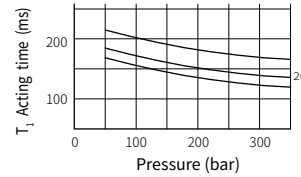
Coding N

Pressure / flow

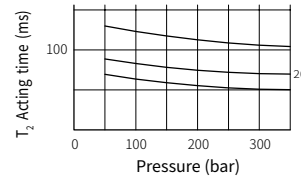




Acting times T1



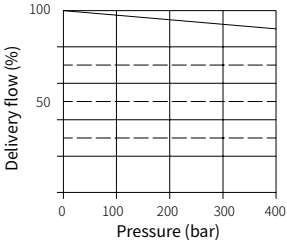
Acting times T2



S_S	Positioning travel of actuator
T_U	Delay < 3 ms
T_1	On-stroke time
T_2	Destroke time
P	Pressure

Coding LSN

Drive speed constant

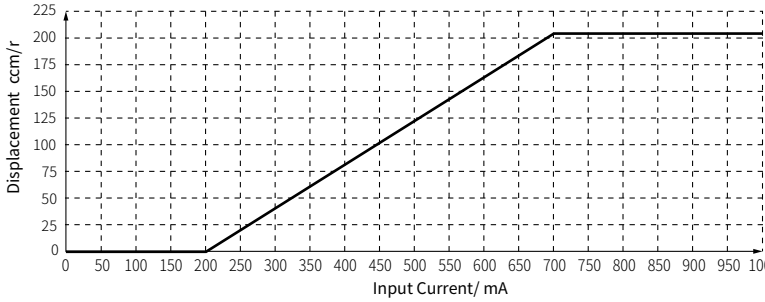


Parameters:

Control accuracy in relation to max. delivery flow
a) Rotation speed n constant,
pressure variable between 30 and 350 bar(< 3%)
b) Pressure p constant,
rotation speed variable (< 1%)

LS line approx. 10% of the volume of the P line.

Coding V （24V DC）



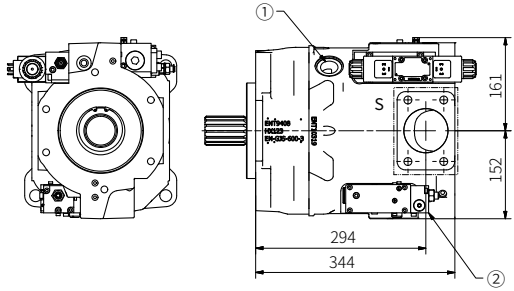
4 Dimensions

All dimensions in mm, subject to change!

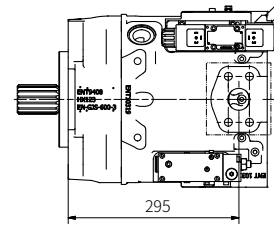
4.1 Basic pump

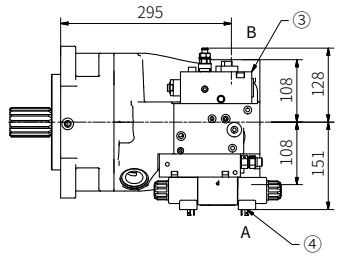
4.1.1 Type V80M-200

Rotating direction **clockwise**
(viewed from shaft journal)



Rotating direction **anti-clockwise**
(viewed from shaft journal)

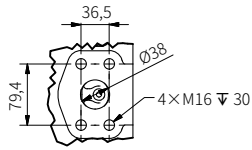




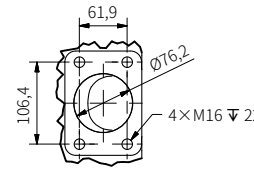
1 Drain port G1" (2x)
2 Power controller
3 N, P, LSP - controller
4 EM - controller

Rotating direction **clockwise**	
A	= pressure port
B	= suction port
Rotating direction **anti-clockwise**	
A	= suction port
B	= pressure port

P (1 : 5)
Pressure port
SAE 1 1/2" 6000 PSI

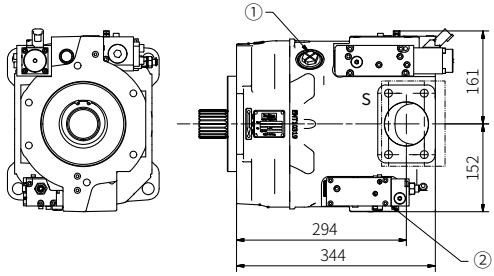


S (1 : 5)
Suction port
SAE 3" 3000 PSI

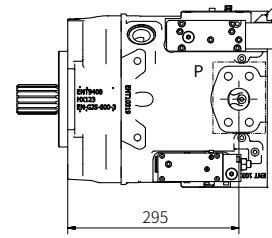


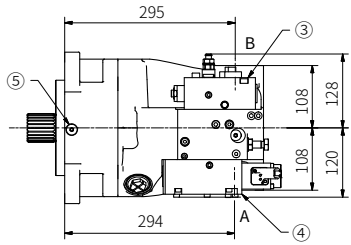
4.1.1 Type V80M-200

Rotating direction **clockwise**
(viewed from shaft journal)



Rotating direction **anti-clockwise**
(viewed from shaft journal)

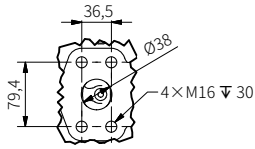




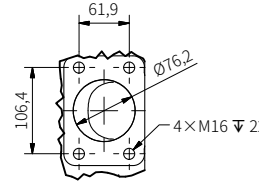
1 Drain port G1" (2x)
2 Power controller
3 N, P, LSP - controller
4 V - controller
5 Bleeding port G 1/4"

Rotating direction **clockwise**	
A	= pressure port
B	= suction port
Rotating direction **anti-clockwise**	
A	= suction port
B	= pressure port

P (1 : 5)
Pressure port
SAE 1 1/2" 6000 PSI



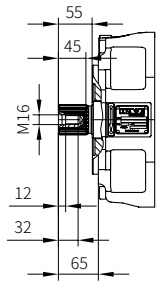
S (1 : 5)
Suction port
SAE 3" 3000 PSI



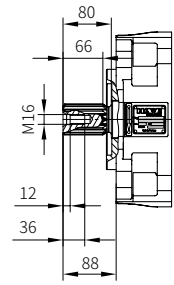
4.1.1 Type V80M-200

Shaft versions

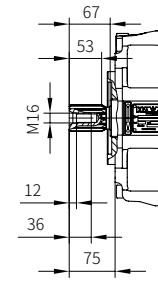
Spline shaft
Coding D
(DIN 5480 W50×2×24×9g)



Spline shaft
Coding S
(SAE-F J 744 15T 8/16 DP)

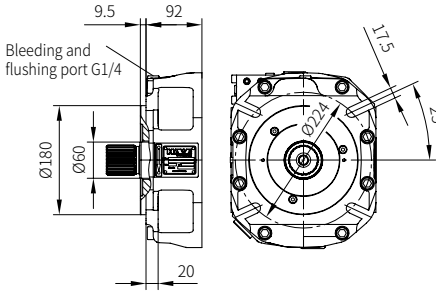


Spline shaft
Coding U
(SAE-D J 744 13T 8/16 DP)

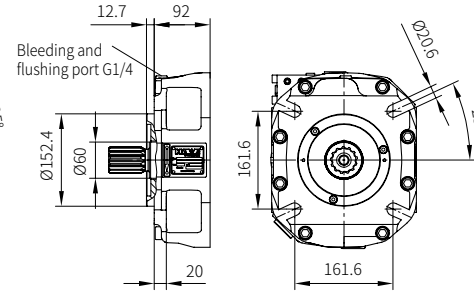


Flange versions

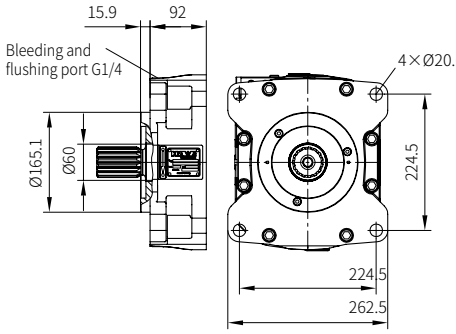
Coding G
(180 B4 HW ISO 3019-2)



Coding W
(SAE-D 4-hole J 744) (152-4 ISO 3019-1)

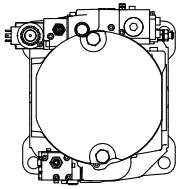


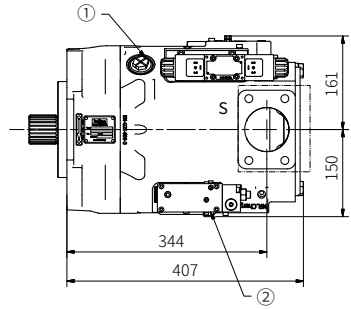
Coding F
(SAE-E 4-hole J 744) (165-4 ISO 3019-1)



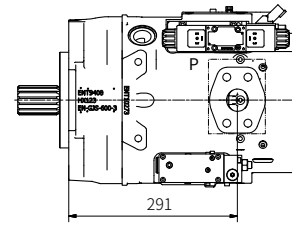
4.1.2 Type V80ML-200

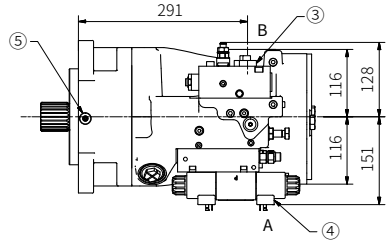
Rotating direction **clockwise**
(viewed from shaft journal)





Rotating direction **anti-clockwise**
(viewed from shaft journal)

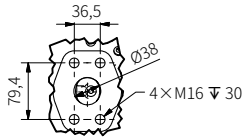




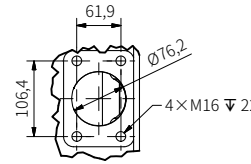
1 Drain port G1" (2x)
2 Power controller
3 N, P, LSP - controller
4 EM - controller
5 Bleeding port G 1/4"

Rotating direction **clockwise**	
A	= pressure port
B	= suction port
Rotating direction **anti-clockwise**	
A	= suction port
B	= pressure port

P (1 : 5)
Pressure port
SAE 1 1/2" 6000 PSI

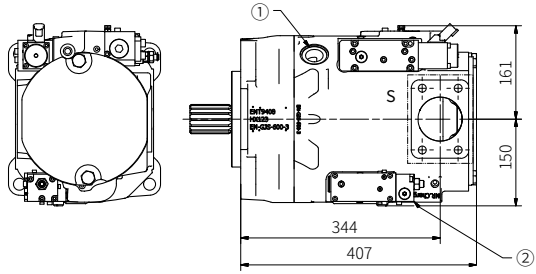


S (1 : 5)
Suction port
SAE 3" 3000 PSI

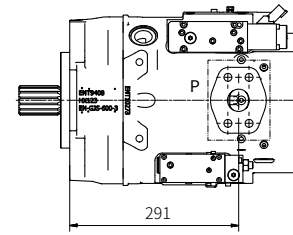


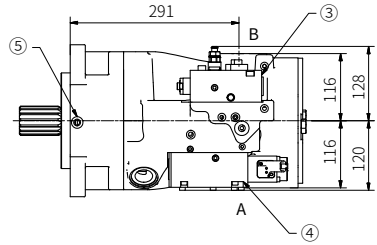
4.1.2 Type V80ML-200

Rotating direction **clockwise**
(viewed from shaft journal)



Rotating direction **anti-clockwise**
(viewed from shaft journal)

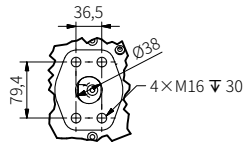




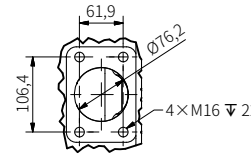
1 Drain port G1" (2x)
2 Power controller
3 N, P, LSP - controller
4 V - controller
5 Bleeding port G 1/4"

Rotating direction **clockwise**	
A	= pressure port
B	= suction port
Rotating direction **anti-clockwise**	
A	= suction port
B	= pressure port

P (1 : 5)
Pressure port
SAE 1 1/2" 6000 PSI



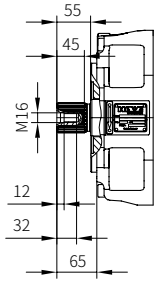
S (1 : 5)
Suction port
SAE 3" 3000 PSI



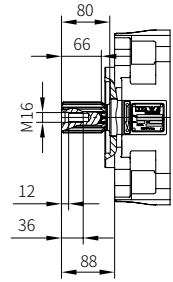
4.1.2 Type V80ML-200

Shaft versions

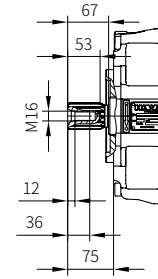
Spline shaft
Coding D
(DIN 5480 W50×2×24×9g)



Spline shaft
Coding S
(SAE-F J 744 15T 8/16 DP)

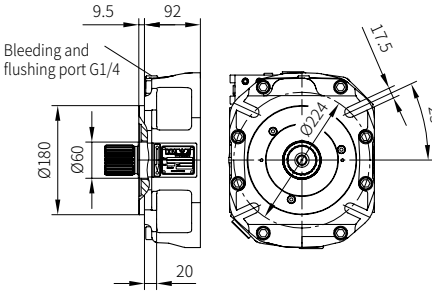


Spline shaft
Coding U
(SAE-D J 744 13T 8/16 DP)

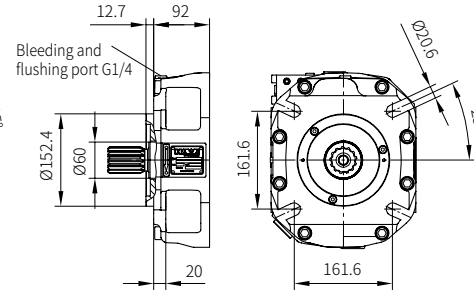


Flange versions

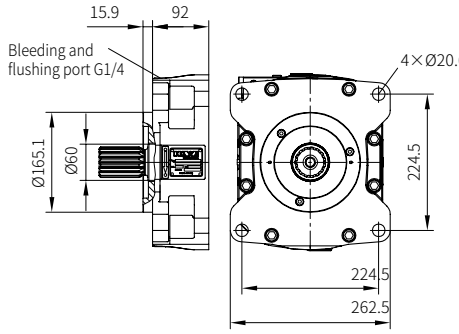
Coding G
(180 B4 HW ISO 3019-2)



Coding W
(SAE-D 4-hole J 744) (152-4 ISO 3019-1)

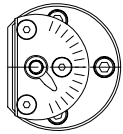


Coding F
(SAE-E 4-hole J 744) (165-4 ISO 3019-1)

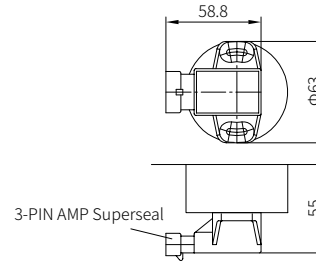


4.2 Pivoting angle indicator

Pivoting angle indicator



With pivoting angle pick-up (Hall sensor)



5 Installation information

5.1 General information

The V80M variable displacement axial piston pump is designed for use in an open circuit.
It can be mounted using a flange in accordance with specifications.
The various controllers can be fitted as separate devices as required.

The following essential points must be noted when installing the pump:
Mounting and removal of the pump and attached components may be performed by trained persons only. Ensure absolute cleanliness during all work. Contamination may have an adverse effect on the function and service life of the pump.

- Remove all plastic plugs prior to initial operation.
- Avoid installing the motor above the tank (see Chapter 5.3, "Installation positions").
- Observe the reference values in Section .
- Prior to initial operation, fill the pump with oil and bleed.
  Automatic pump filling via the suction line by opening the drain ports is not possible.
- Prevent the pump and suction line from running dry.
- Always ensure a constant supply of oil.
  Even a brief shortage in the supply of hydraulic fluid to the pump may damage internal parts.
  This may not be immediately evident after initial operation.
- The hydraulic oil returning to the tank from the system must not be sucked back in immediately (baffles).
- Run the pump for approx. 10 minutes at max. 50 bar after initial operation.
- Thorough bleeding/flushing of the entire system is recommended before the full pressure range is used.
- Observe the max. permissible operating range temperatures (see Chapter 3, "Parameters") at all times.
- Always comply with the specified oil purity classes (see Chapter 3, "Parameters");
  provide appropriate hydraulic fluid filtering.
- Use of a filter in the suction line must be approved by InLine Hydraulik.
- Include a main pressure-limiting valve in the pressure line to limit the max. system pressure.

5.2 Ports

The nominal diameter of the connecting lines depends on the specified operating conditions, the viscosity of the hydraulic fluid, the start-up and operating temperatures and the rotation speed of the pump. In principle we recommend the use of hose lines due to the superior damping characteristics.

Bleeding and flushing port

The V80M pump is fitted with a G 1/4" (BSPP) bleeding and flushing port. This is used to bleed and flush the front shaft bearing in the case of vertical installation.

Pressure port

The pressure port connection is established in the case of type V80M via SAE ports, see Chapter 4 , "Dimensions". Metric attachment threads are used in deviation from the standard.
Observe the tightening torque specified by the fitting manufacturer.

Suction port

The suction port can be established via SAE ports; see Chapter 4, "Dimensions". Metric attachment threads are used in deviation from the standard.
If possible, route the suction line to the tank in such a way that it is steadily rising. This allows trapped air to escape. Observe the specifications in Chapter 5.3, "Installation positions". The absolute suction pressure must not fall below 0.85 bar. A hose line should generally be used in preference to a rigid pipe.

Drain port

The V80M Pump has 2 drain ports G 1" (BSPP).
The nominal diameter of the leakage line must not be less than 16 mm. The cross-section is determined by the max. permissible housing pressure.
Integrate the leakage line in the system in such a way as to prevent direct connection with the suction line of the pump.
All drain ports can be used simultaneously.
A separate leakage line from the controller to the tank is not required. Observe the specifications in Chapter 5.3, "Installation positions".
The top drain port can be used to fill the housing.

LS port for version LSP

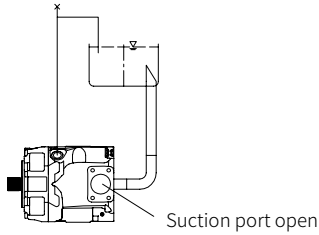
The LS line is connected to the controller via a G 1/4" (BSPP) threaded connection.
The nominal diameter of the line depends on the installation position of the pump and should be 10% of the pressure line nominal volume. A hose line should generally be used in preference to a rigid pipe.

• When the prop ortional directional spool valve is in a neutral position, the LS line must be fully relieved (only controller type LSP). In the case of controller type LSPT, relief takes place internally in the controller.

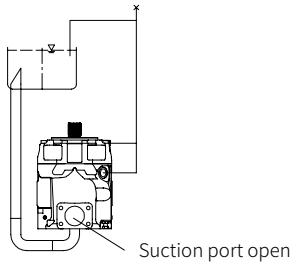
5.3 Installation positions

The variable displacement axial piston pump V30E can be installed in any installation position.

Horizontal installation: (pump below the min. fill level)
For horizontal installation, use the uppermost drain port.



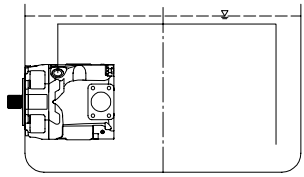
Vertical installation: (pump below the min. fill level)
Mount the pump so that the pump mounting flange is facing upwards. For vertical installation, use the uppermost drain port. Also connect the G 1/4" (BSPP) bleeding port on the pump flange. Take appropriate measures to ensure continuous bleeding of this line (line routing/bleeding).
For installation with the pump flange facing downwards, please contact InLine Hydraulik.

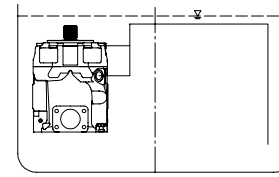


5.4 Tank installation

Tank installation (pump below the min. fill level)

The pump can be operated either with or without a suction tube. Using a short suction intake is recommended.



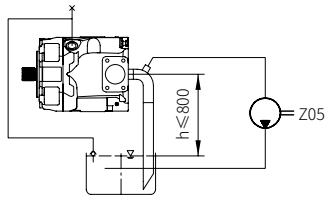


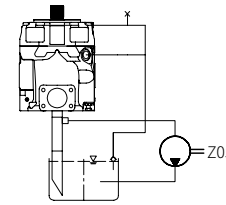
Additional notes regarding installation above the fill level

Special measures are required if the pump is installed above the fill level. The pump must not run dry via the pressure, intake, drain, bleed or control lines. This applies in particular to long periods of downtime.

- A check valve (opening pressure approx. 0.5 to 0.6 bar) in the overflow oil line can prevent the pump housing from being emptied.
- Facilitate bleeding of connecting lines via separate bleed openings.
- Adjust the bleeding sequence to the specific installation.
- A gear pump must be provided in order to draw air from the suction line.

For specialist advice on designing axial piston pumps, the following contact form is available:
Checklist for designing variable displacement axial piston pumps: B 7960 checklist.





For further information on installation, operation and maintenance, see the relevant assembly instructions: B 7960, B 5488.

6 Installation, operation and maintenance information

6.1 Designated use

This fluid-power product has been designed, manufactured and tested acc. to standards and regulations generally applicable in the European Union and left the plant in a safe and fault-free condition.
To maintain this condition and ensure safe operation, operators must observe the information and warnings in this documentation.
This fluid-power product must be installed and integrated in a hydraulic system by a qualified specialist who is familiar with and adheres to general engineering principles and relevant applicable regulations and standards.
In addition, application-specific features of the system or installation location must be taken into account if relevant.
This product may only be used as a flow control valveas a pump within oil-hydraulic systems.
The product must be operated within the specified data. This documentation contains the technical parameters for various product versions.

Note:
Non-compliance will void any warranty claims made against InLine Hydraulik.

6.2 Assembly information

The hydraulic accumulator must be integrated in the system via state of the art connection components (screw fittings, hoses, pipes, etc.). The hydraulic system must be shut down as a precautionary measure prior to dismounting; this applies in particular to systems with hydraulic accumulators.

6.3 Operating instructions

Product, pressure and/or flow settings

All statements in this documentation must be observed for all product, pressure and/or flow settings on or in the hydraulic system.

⚠ Caution:
Risk of injury on overloading components due to incorrect pressure settings!
- Always monitor the pressure gauge when setting or changing the pressure.

⚠ Caution:
Risk of injury due to unexpected movement processes in the machine due to incorrect flow setting!
On changing the flow settings loads will move more slowly or more quickly.
The consequence can be unexpected movements.
- Only make flow settings or changes in a controlled manner!

Filtering and purity of the hydraulic fluid

Soiling in the fine range, e.g. abraded material and dust, or in the macro range, e.g. chips, rubber particles from hoses and seals, can cause significant malfunctions in a hydraulic system. It is also to be noted that new hydraulic fluid "from the drum" does not necessarily meet the highest purity requirements.
For trouble-free operation pay attention to the purity of the hydraulic fluid (see also purity class in Chapter 3, "Parameters").

6.4 Maintenance information

This product is largely maintenance-free.
Check that the product is securely fastened in the mounting hole at regular intervals, but at least once per year.
Conduct a visual inspection to check the hydraulic connections for damage at regular intervals, but at least once per year. If external leaks are found, shut down and remedy.
Check the device surfaces for dust deposits at regular intervals (but at least annually) and clean the device if required.