

RE 10 530/01.03

Motor-pump module Type MPM

Compact hydraulic drive unit with electric motor, PV7
variable displacement pump and integrated cooler
Series 1X



Type MPM2-1X/...

Table of contents

Contents	Page
Features	1
Ordering code, symbol	2
Preferred types	2
Function, section	3
Technical data	4; 5
Characteristic curves, noise pressure level, cooling capacity	6
Unit dimensions	7
Accessories	8
Installation instructions for MPM with pressure filter and multi-station manifold plate	9
Safety notes	10
Notes on engineering and installation	10
Notes on commissioning	11

Features

Vane pump:

- Low losses
- Low operating noise
- Low flow pulsation
- Very short control times

MPM:

- No additional cooling required for hydraulics
- Very compact build
- Multi-station manifold can be mounted directly
- Integrated pressure filter possible



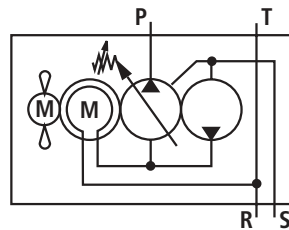
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Ordering code

MPM	2	1X	A0	03	01	2,5	01	*
Motor-pump module								Further details in clear text
Number of pumps	= 2							Voltage, frequency
Series		= 1X						01 = 400 V, 50 Hz or 460 V 60 Hz
Series 10 to 19 (10 to 19: unchanged installation and connection dimensions)								Continuous power in kW (operating mode S1)
Variable displacement pump								Multi-station manifold
Displacement: 30 cm ³								L0 = Without multi-station manifold
Displacement: 25 cm ³								L4 = 4-fold multi-station manifold
Displacement: 20 cm ³								L8 = 8-fold multi-station manifold
Variable displacement pump								Filter installation, subplate mounting
Controller type, direct operated with adjustment screw: A0			= A0					F0 = Without filters installed, subplate mounting
Variable displacement pump zero stroke pressure range								F1 = Pressure filter block with bypass and integrated clogging indicator
Size 30 cm ³ up to 60 bar								Suction and pressure port
Size 25 cm ³ up to 80 bar								01 = Pipe thread to ISO 228/1
Size 20 cm ³ up to 100 bar								
Fixed displacement pump								
Displacement: 22 cm ³ (with variable displacement pump size 20 only)								
Displacement: 32 cm ³								
Fixed displacement pump								
Pressure stage: up to 30 bar								= 03

Symbol



Preferred types (available at short notice)

Material number	Type
R900787530	MPM2-1X/20A0-10/32-03/01-F0L0/2,5-01
R900787381	MPM2-1X/20A0-10/32-03/01-F1L0/2,5-01
R900762867	MPM2-1X/25A0-10/32-03/01-F0L0/2,5-01
R900719400	MPM2-1X/25A0-10/32-03/01-F1L0/2,5-01

Further preferred types and standard components are listed in our EPS (standard price list).

Function, section

The motor-pump module, type MPM, is a compact drive unit with integrated cooling function to supply hydraulic clamping functions, for example in lathes, grinding machines or machine tools. The MPM is designed for high dynamics, which renders accumulators unnecessary in many cases.

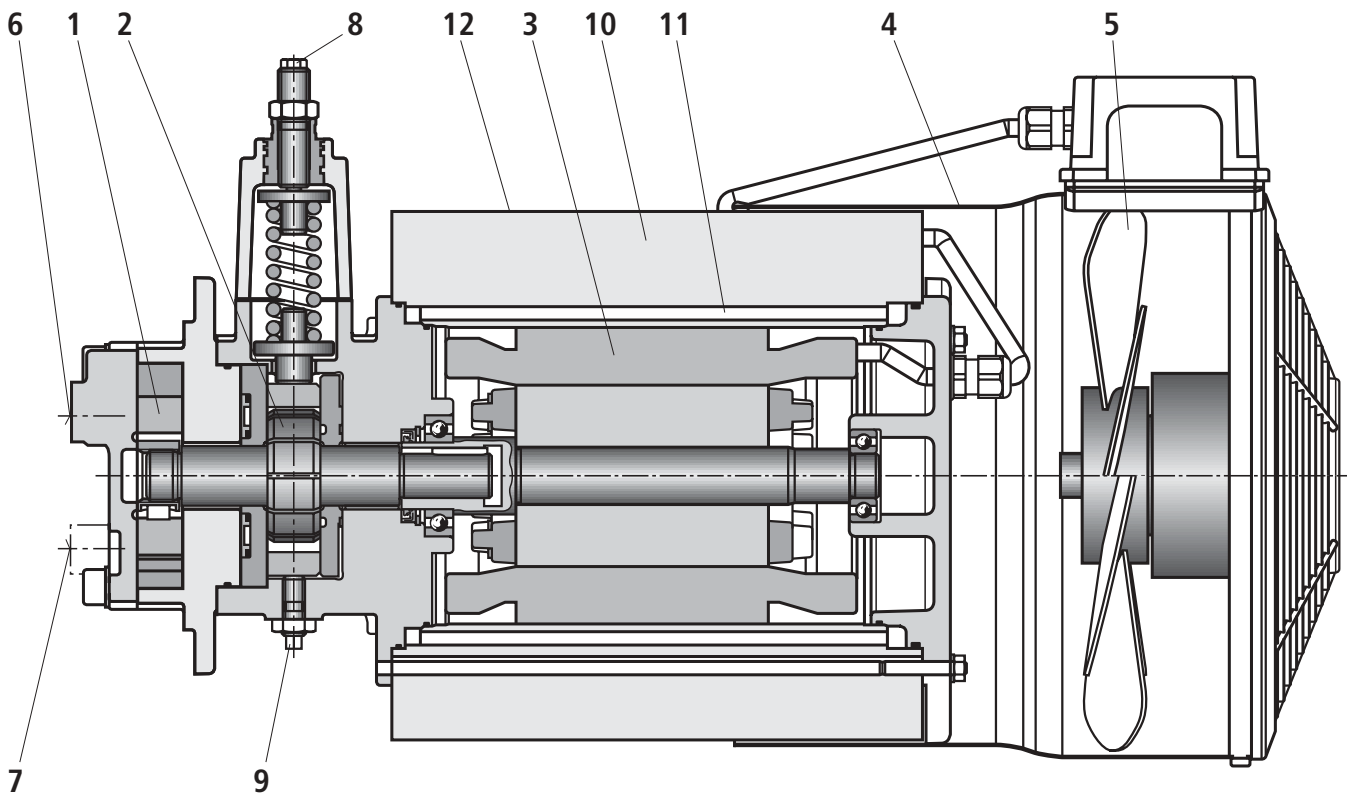
The basic MPM module comprises the variable displacement pump, electric motor and cooler. Optionally, the MPF can be supplied with pressure filter and directly flanged-on multi-station manifold plate as a functional unit. In this extension stage, piping work is no longer necessary.

The basic MPM unit consists of an annular gear pump (1), a variable displacement vane pump type PV7 (2), an electric motor (3), a housing (10), a fan hood (4) and a separately driven fan (5).

The annular gear pump aspirates the operating medium from the tank via port (6) and displaces oil through the low-pressure section of the vane pump into the oil channels (11) of the heat exchanger and back to the tank via the return line (7).

The pressure-compensated valve pump delivers the flow that is required for the machine function. The system pressure can be adjusted by means of a screw (8), the displacement by means of an adjustment screw (9). Leakage of the vane pump is internally re-fed to the suction area.

The heat transfer of the entire system is fed via the circulating flow generated by the annular gear pump to the electric motor housing (10). A separately driven fan (5) delivers ambient air to the large-area finned profile (12) where the heat exchange takes place.



Technical data (for applications outside these parameters, please consult us!)**Pumps**

Design	Drive unit with PV7 variable displacement pump, el. motor and cooler					
Type	MPM					
Type of mounting	Tank top					
Valves mounted	As required					
Installation position	Vertical; horizontal on enquiry					
Direction of rotation	Fan counter-clockwise, air inlet on fan hood, air outlet on finned profile					
Speed	min ⁻¹	900 ... 1800				
Size / displacement	cm ³	Variable displacement pump			Fixed displacement pump 32	
		20	25	30		
Operating pressure, absolute	Outlet	bar	100	80	60	–
	Inlet	bar (absolute)	–	–	–	0.8 to 2.5
Hydraulic fluid	HLP mineral oil to DIN 51 524, part 2					
Hydraulic fluid temperature range	°C	– 10 to + 70, observe permissible viscosity range				
Ambient temperature range	°C	– 20 to + 60,				
Viscosity range	mm ² /s	16 to 160, at operating temperature max. 800, at start-up in displacement operation				
Cleanliness class to ISO code	Max. permissible degree of contamination of the hydraulic fluid to ISO 4406 class 19/16/13 ¹⁾					
Weight	kg	44				

¹⁾ The cleanliness classes specified for the components must be adhered to in the hydraulic system. Effective filtration prevents malfunction and at the same time prolongs the service life of components.

For the selection of filters, see data sheets RE 50 070, RE 50 076 and RE 50 081.

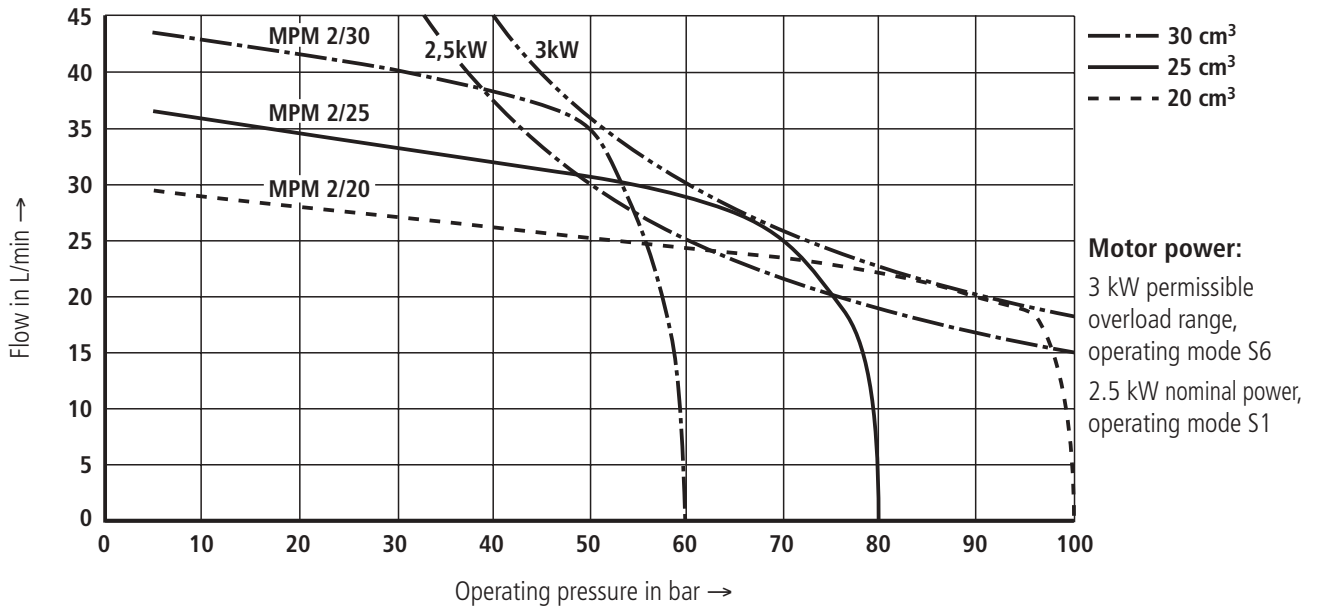
Electric motor

Design	3-phase asynchronous motor; 4-pole; squirrel-cage (surface- and fluid-cooled); temperature class (insulation class) F		
Type of protection	IP55		
Power	kW	2.5	rated power, operating mode S1
		3.0	temporary, operating mode S6
Thermal protection	Without		
Voltage	V	400 Y / 380...420 Y	460 Y / 440...480 Y
Frequency	Hz	50	60
Nominal speed	min ⁻¹	1390	1690
Nominal torque	Nm	19.5	18.7
Min. breakdown torque	Nm	31.2	30
Power factor cos φ		0.80	0.81
Nominal current	A	5.9	6.1

Technical data (for applications outside these parameters, please consult us!)**Fan**

Type	Wistro FLA/Bg 132		
Motor design	3-phase asynchronous motor; 2-pole temperature class (insulation class) F		
Type of protection	IP 66		
Thermal protection	Without		
Voltage	V	380 - 500	
Frequency	Hz	50	60
Nominal speed	min ⁻¹	2650	2950
Nominal current	A	0.24	0.22
Power consumption	W	136	110

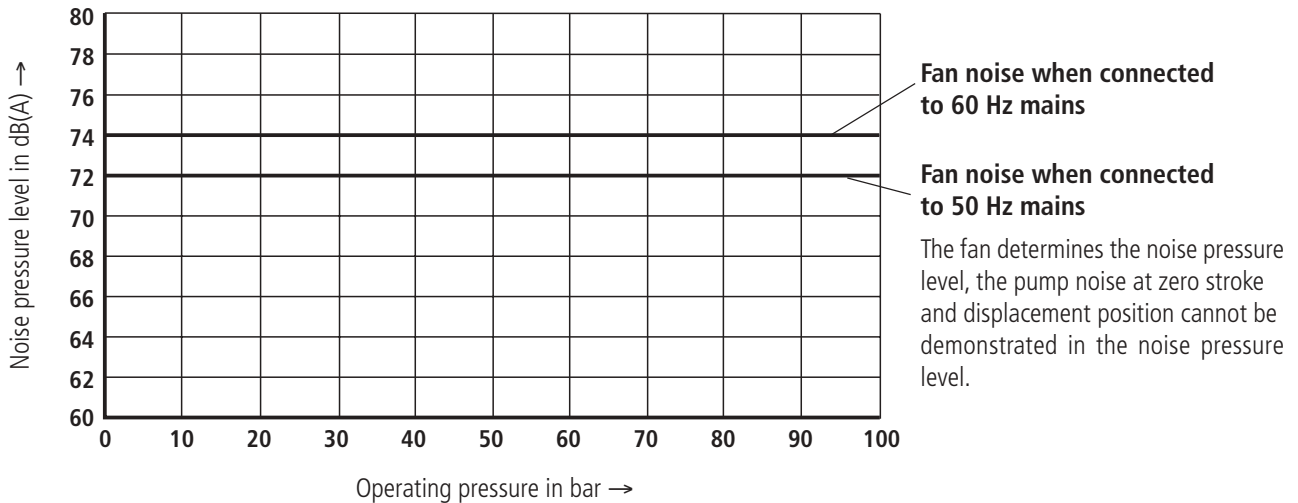
Characteristic curves: Variable displacement pump, type PV7/20-25 (measured at $n = 1450 \text{ min}^{-1}$; $v = 46 \text{ mm}^2/\text{s}$ and $\vartheta = 40 \text{ }^\circ\text{C}$)



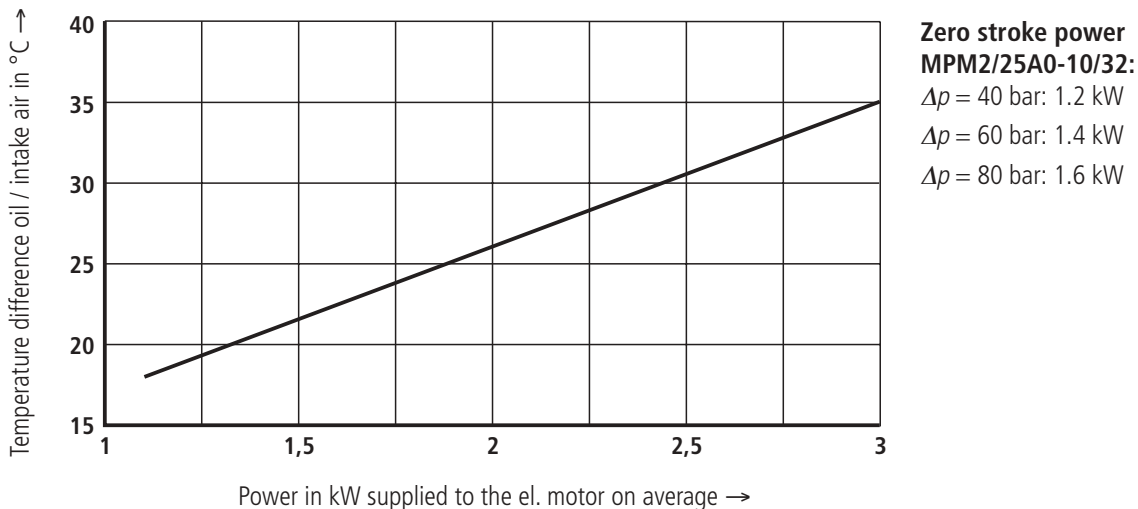
Noise pressure level

Measured in an anechoic chamber according to DIN 45 635, part 26

Distance: Microphone – MPM = 1 m

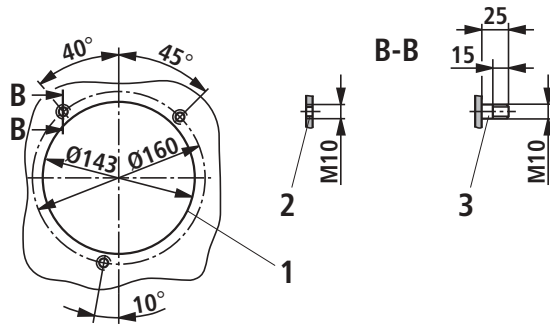
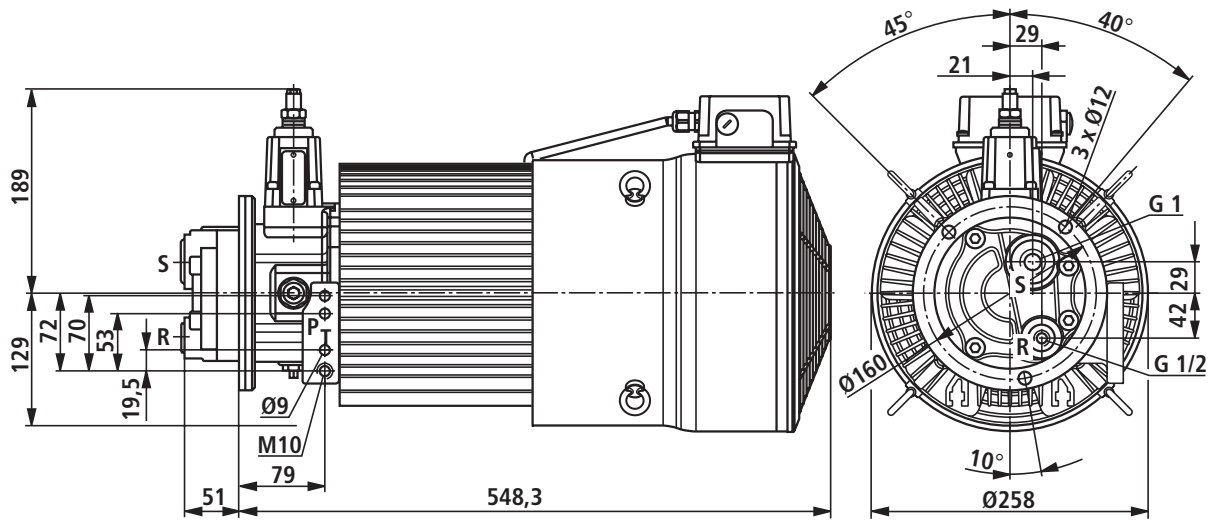


Cooling capacity



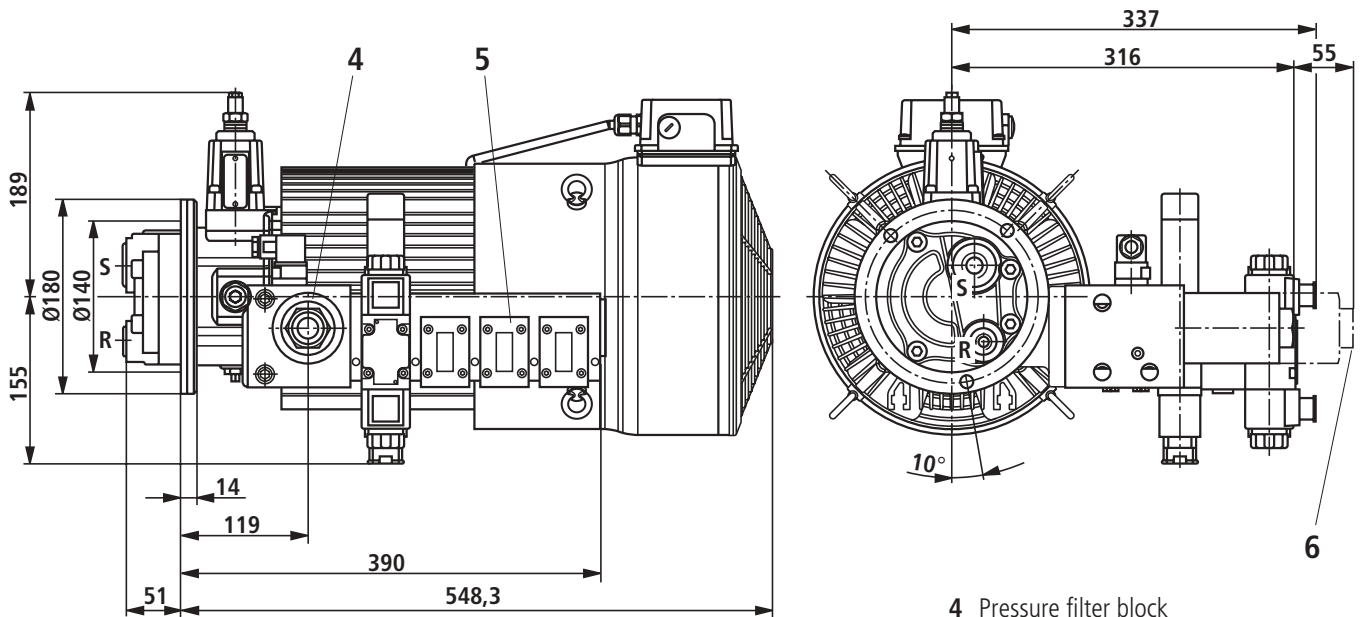
Unit dimensions (dimensions in mm)

Standard



- 1 Cutout
Tightening torque $M_T = 5^{+5}$ Nm for M10
- 2 With thread M10
- 3 With bolt M10

With pressure filter block and built-on 4-fold multi-station manifold plate



- 4 Pressure filter block
- 5 4-fold multi-station manifold plate
- 6 Space required to remove filter

Accessories

Pressure filter block

The pressure filter block includes all the components required for a reliable filtration of the hydraulic fluid to protect downstream valves. The filter block is suitable for direct mounting to the MPM. Special versions of multi-station manifold plates type HSR can be mounted on the MPM.

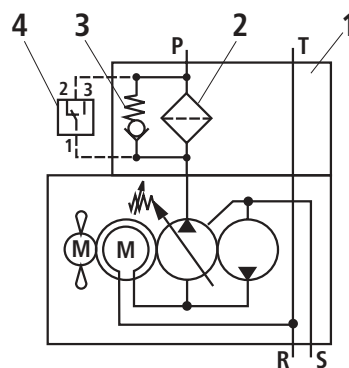
The pressure filter block (1) comprises a pressure filter (2), a by-pass valve (3) and an electrical clogging indicator (4).

Technical data

Operating pressure	bar	160
Filter element		V3.0510-06G /1803032, material number: R900760727
Filter rating		$\beta_{12}(c) = 200$
By-pass valve	bar	Response pressure 5.5 ... 8
Differential pressure switch	bar	Closing point 4...5
Switching current		max 0.17 A AC / 0.25 A DC
Switching voltage		max. 120 V AC / 175 V DC
Type of protection		IP 65
Connection		Plug-in connector to DIN EN 175 301-803 ¹⁾
Connecting cable cross-section	mm ²	1.5

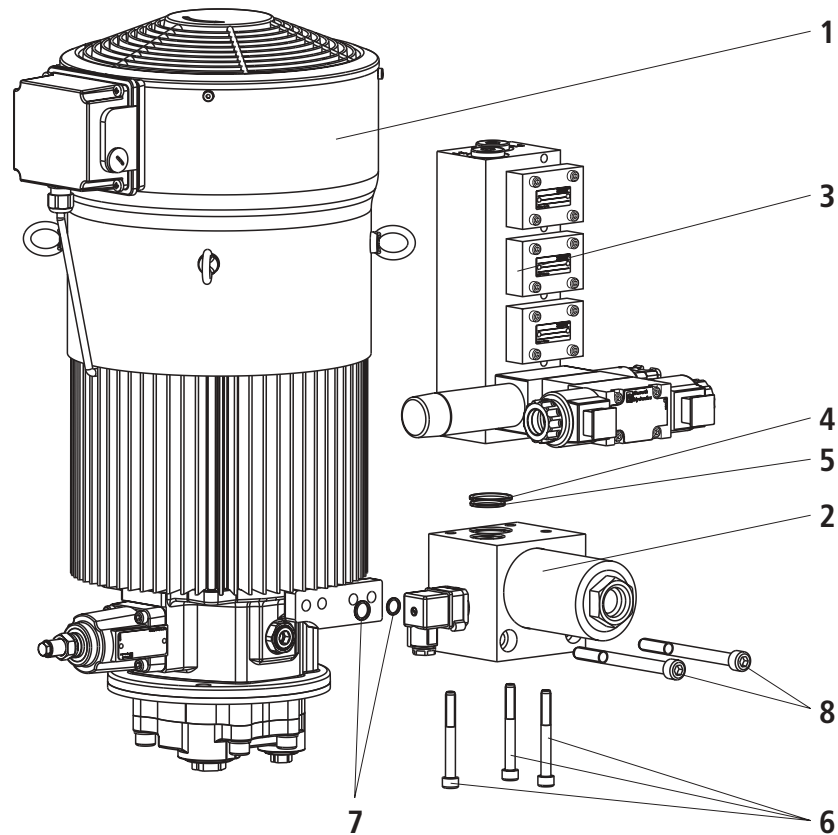
¹⁾ Separate order

Symbol of MPM with built-on pressure filter block



Multi-station manifold plate with valves mounted

TComplete units with multi-station manifolds and placement of valves will be delivered after consultation.



1st step

Wet R-rings items 5 and 4 with a suitable lubricant and insert them into the recesses of the filter block item 2. Then bolt the HSR plate item 3 and filter block item 2 together using the 3 cheese head screws M8 item 6 (tightening torque for item 6: $M_T = 7.9 \text{ Nm}$).

2nd step

Wet R-rings item 7 with a suitable lubricant and insert them into the recesses of the filter block item 3. Then bolt the HSR plate item 3 with the filter block to the mountign face of item 1 using the 2 cheese head screws M10 item 8 (tightening torque for item 8: $M_T = 39 \text{ Nm}$).

Safety notes

Application conditions

The customer must ensure that the MPM is operated correctly and in accordance with the intended purpose. The MPM has been designed for industrial applications and must not be used on mobile equipment or in the open air. The MPM must not be exposed to vibrations. Its use in areas with an explosion hazard is prohibited.

Commissioning of the MPF is not permitted until the conformity of the final product with Machinery Directive 89/392/EEC has been confirmed (observe EN 60204-1).

Cooling function

Select the place of installation so that the ambient air required for cooling can be freely flow in and out. During initial commissioning, the stagnation temperature must be checked. Contaminated ambient air can affect the cooling performance. The operator must ensure that surfaces that are used for exchanging air are cleaned at regular intervals. The oil temperature in the tank must be kept within permissible limits by installing temperature switches.

Commissioning and maintenance

Work on the MPM may only be carried out when the motor is switched off and the hydraulic system depressurised. Commissioning and maintenance work must be carried out by trained and qualified personnel taking into account valid regulation. (Observe VDE 0105; IEC 364)

Notes on engineering and installation

Place of installation

The place of installation for the MPM is to be selected so that fresh air can freely enter in the area of the fan hood and the exhaust air can freely flow out in the area of the finned profile. If required, allow the aspiration of fresh air / or direct the exhaust air away from the air intake point by installing air baffles.

Fluid tank

- Adapt the useful capacity of the tank to the operating conditions.
- The permissible fluid temperature must not be exceeded; if required, provide a cooler.

Lines and connections

- We recommend the use of seamless precision steel pipes in accordance with DIN 2391 and pipe connections that can be loosened.
- Select the clear width of pipes to suit the connections/ports
- For the inlet pressure, see page 4.
- Thoroughly clean pipes and fittings before their installation.

Use screw-in fittings for suction and return lines. Screwing pipes directly into the pump cover is not permitted.

Filters

We recommend the use of a pressure filter that is offered with the MPF (see accessories on page 8). Under unfavourable conditions, the use of an additional return line filter may be required. The decisive factor is the compliance with the required cleanliness class (see technical data on page 3).

Hydraulic fluid

- Please observe our regulations in data sheet RE 07 075.
- We recommend the use of brand hydraulic oils.
- Do not mix oils of different specifications, since this can result in decomposition and deterioration of the lubrication properties.

Protective guards

During operation in line with the intended purpose, temperatures of up to 80°C can occur on surfaces of the MPM. If the MPM is installed in accessible areas, provide a protective guard.

⚠ Caution!

If Bosch Rexroth hydraulic products are positioned in the vicinity of potential ignition sources or powerful heat radiators, attach a shield in order to prevent possibly leaking hydraulic fluid from igniting and to protect hoses from premature aging. Hydraulic oil based on mineral oil is hazardous to water and inflammable. It may only be used, if the relevant safety data sheet of the supplier is available and all precautions described therein were taken. If leakage of the hydraulic product can result in the contamination of water or soil, the hydraulic product must be placed on a suitable collecting tray. In Germany, hydraulic systems fall under "systems operated with water-endangering substances in the sense of the Water Resources Act (WHG)." In this context, please observe in particular §1 and §19 WHG (§19g, §19i, §19l).

- The fluid must be changed at certain intervals in accordance with the operating conditions. Clean the fluid tank from residues when changing the oil.

Technical data

All technical data given here depend on manufacturing tolerances and are valid for certain boundary conditions. Please note that for this reason certain variations are possible and that under certain boundary conditions (e.g. viscosity) technical data may also vary.

Associated data sheets

- RE 07 900 Installation, commissioning and maintenance of hydraulic systems
- RE 07 080 Installation, commissioning and maintenance of hydraulic pumps
- RE 07 075 Hydraulic fluids based on mineral oil for vane pumps
- RE 10 522 Direct operated vane pumps

For further notes and suggestions, please refer to The Hydraulic Trainer, Volume 3, RE 00 281, "Planning hydraulic systems".

Electrical and hydraulic connection

Work on the system may only be carried out by qualified specialist personnel when the motor is switched off and the hydraulic system is disconnected from the power supply, secured against unintended restarts and depressurised.

Notes on commissioning

Erection

- Lifting gear is to be attached to the eyebolts included in the scope of supply.
- When transporting screwed-on tanks and additional loads, use a suitable means of transport. The eyebolts included in the scope of supply are intended only for lifting the MPM.
- Inspect the consignment for damage occurred during transport. In the case of visible damage, the unit must not be installed.
- Clean the tank and pipes before installing the MPM.
- Check the mounting space for the MPM for evenness.
- Use damping rings (included in the scope of supply).
- Install suction and return pipes only with screw-in fittings.
- Clean flange and sealing faces. Insert seal rings safely (grease them).
- Tighten the fixing screws at the specified torque.
- Connect the electric motor in star connection. In no case may the electrical connection of the fan be changed in the terminal box.
- Check the setting of the protective motor switch (max. 6.6 A).
- Check the fan; the fan impeller must freely rotate.
- Fill the tank only through fine filters.

Commissioning

- Check the direction of rotation of the fan by briefly switching on the electric motor. An anti-clockwise rotation of the fan corresponds to a clockwise rotation of the pump. Operation: The fan aspirates air through the protective grid and blows it towards the housing profile.
- During initial commissioning and re-commissioning after oil was newly filled in, let foaming oil drain in pressureless circulation.
- After having the system switched on, take care that the oil is bubble-free.
- Adjust the pressure to the specified operating pressure.
- Check noise emission and control characteristics as well as the stagnation temperature.

Maintenance

Determine suitable maintenance intervals in dependence upon ambient and operating conditions.

Work to be carried out:

- Check the fixing screws for the specified tightening torque
- Inspect for leakage
- Clean the surfaces exposed to the air flow
- Replace filter elements

During operation, check the system for the generation of noise and heat, vibration characteristics and the control characteristics of the variable displacement pump (pressure peaks). Any changes can suggest wear. In any case, establish and eliminate the cause. When in doubt, switch the system off and have it inspected by specialists.

**Bosch Rexroth AG
Industrial Hydraulics**

D-97813 Lohr am Main
Zum Eisengießer 1 • D-97816 Lohr am Main
Telefon 0 93 52 / 18-0
Telefax 0 93 52 / 18-23 58 • Telex 6 89 418-0
eMail documentation@boschrexroth.de
Internet www.boschrexroth.de

Bosch Rexroth Limited

Cromwell Road, St Neots,
Cambs, PE19 2ES
Tel: 0 14 80/22 32 56
Fax: 0 14 80/21 90 52
E-mail: info@rexroth.co.uk

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