

Electric Drives
and Controls

Hydraulics

Linear Motion and
Assembly Technologies

Pneumatics

Service

Rexroth
Bosch Group

Drive module

RE 51145/06.12
Replaces: 05.12

1/16

Type UPE 5

Component series 1X
Maximum operating pressure 250 bar
Drive power 2.2 to 4.0 kW



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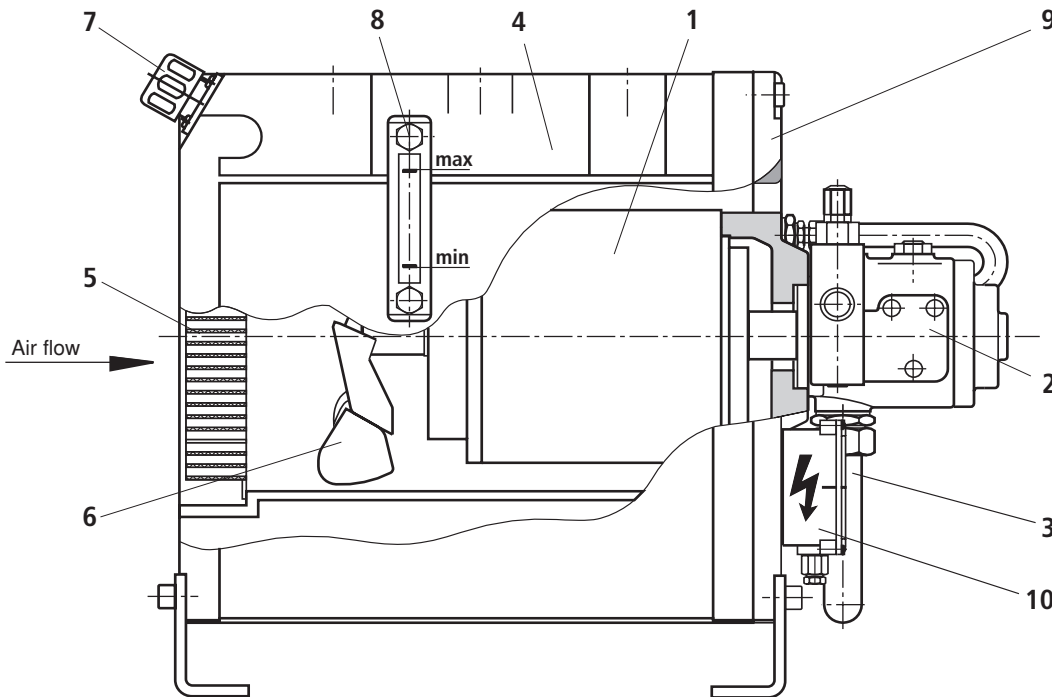
Features

- 100 % duty cycle
- Compact design
- Low-noise
- High cooling power
- Broad field of application
- Large number of variants
- Different mounting possibilities
- Complete hydraulic control possible (in this connection see data sheet 51156)
- Ready for connection

Applications

- Machine tools
- Lifting platforms
- Conveyors
- Test stands
- Winding machines

Function, section, symbols



Due to its concept, the drive module type UPE 5 has a very compact design. The pump (2) is driven by means of the electric motor (1). Electric motor and pump are connected without coupling. The pump shaft is plugged into the hollow drilled shaft end of the electric motor. That keeps the pump-motor group very short. The pump (2) sucks in the hydraulic fluid from the tank (4) through the suction hose (3) and delivers it to the hydraulic control. The hydraulic fluid flowing back from the control can be led through the oil-air cooler (5) via the ports K1 and K2. Afterwards, the cooled hydraulic fluid is led back into the tank. By means of the axial fan wheel (6) mounted at the electric motor, cold fresh air is sucked in by the oil-air cooler (5). This cools the hydraulic fluid and the electric motor. The tank (4) can be filled through the filling

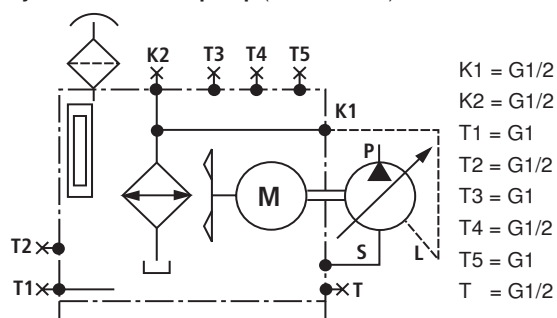
plug (7). The oil level can be monitored by means of the oil level display (8). The tank is closed by a tank cover (9). To it, the pump/motor group (1; 2) and the terminal box (10) are attached. The drive module is delivered ready for connection.

Optionally, the drive module can also be equipped with an electric monitoring of the oil level, the oil temperature and a complete hydraulic control (see 51156) e.g. filter, accumulator and valves.

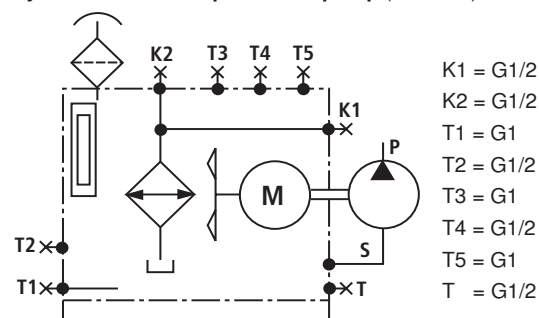
Upon request, oil-water cooling, oil tray according to the Water Resources Act (WHG), double pump as well as an additional tank are also possible.

⚠ Attention! The drive module may heat up during operation → **Risk of injury!**

Symbol for control pump (A10VSO, V7)



Symbol for fixed displacement pump (GF2, AZ)



Ordering code

UPE 5-1X/																			
Component series 10 to 19 (10 to 19: unchanged installation and connection dimensions)				= 1X															
Drive power																			
2.20 kW																			
3.00 kW																			
4.00 kW																			
Pumps																			
Axial piston variable displacement pumps																			
A10VSO10DFR1/52R-PPA14N00 (data sheet 92073)																			
A10VSO18DFR1/31R-PPA12N00 (data sheet 92712)																			
Internal gear pumps (data sheet 10213)																			
PGF2-2X/006RE01VE4																			
PGF2-2X/008RE01VE4																			
PGF2-2X/011RE01VE4																			
PGF2-2X/013RE01VE4																			
PGF2-2X/016RE01VE4																			
External gear pumps (data sheet 10089)																			
AZPF-1X-004RAB01MB																			
AZPF-1X-005RAB01MB																			
AZPF-1X-008RAB01MB																			
AZPF-1X-011RAB01MB																			
AZPF-1X-016RAB01MB																			
AZPF-1X-022RAB01MB																			
Vane pumps																			
PV7-1X/10-14RE01MC0-16																			
PV7-1X/10-20RE01MC0-10																			
PV7-1X/16-20RE01MC0-16																			
PV7-1X/06-10RA01MA0-10																			
PV7-1X/06-14RA01MA0-07																			
PV7-2X/20-20RA01MA0-10																			
PV7-2X/20-25RA01MA0-10																			

Standard types: Drive module

Type A10VSO	Material no.
UPE5-1X/4,00A10VSO10A-H-0	R904100332
UPE5-1X/4,00A10VSO18A-H-0	R901328541
Type PGF2	
UPE5-1X/4,00GF2/006A-H-0	R901077149
UPE5-1X/4,00GF2/008A-H-0	R901328588
UPE5-1X/4,00GF2/011A-H-0	R901328587
UPE5-1X/4,00GF2/013A-H-0	R901328586
UPE5-1X/4,00GF2/016A-H-0	R901328585
Type AZPF	
UPE5-1X/4,00AZ/004A-H-0	R901328589
UPE5-1X/4,00AZ/005A-H-0	R901328583
UPE5-1X/4,00AZ/008A-H-0	R901071582
UPE5-1X/4,00AZ/011A-H-0	R901328582
UPE5-1X/4,00AZ/016A-H-0	R901328581
UPE5-1X/4,00AZ/022A-H-0	R901073015

Type PV7	Material no.
UPE5-1X/4,00V7/06-14A-H-0	R900987596
UPE5-1X/4,00V7/10-14A-H-0	R900987572
UPE5-1X/4,00V7/10-20A-H-0	R901328957
UPE5-1X/4,00V7/16-20A-H-0	R901328956

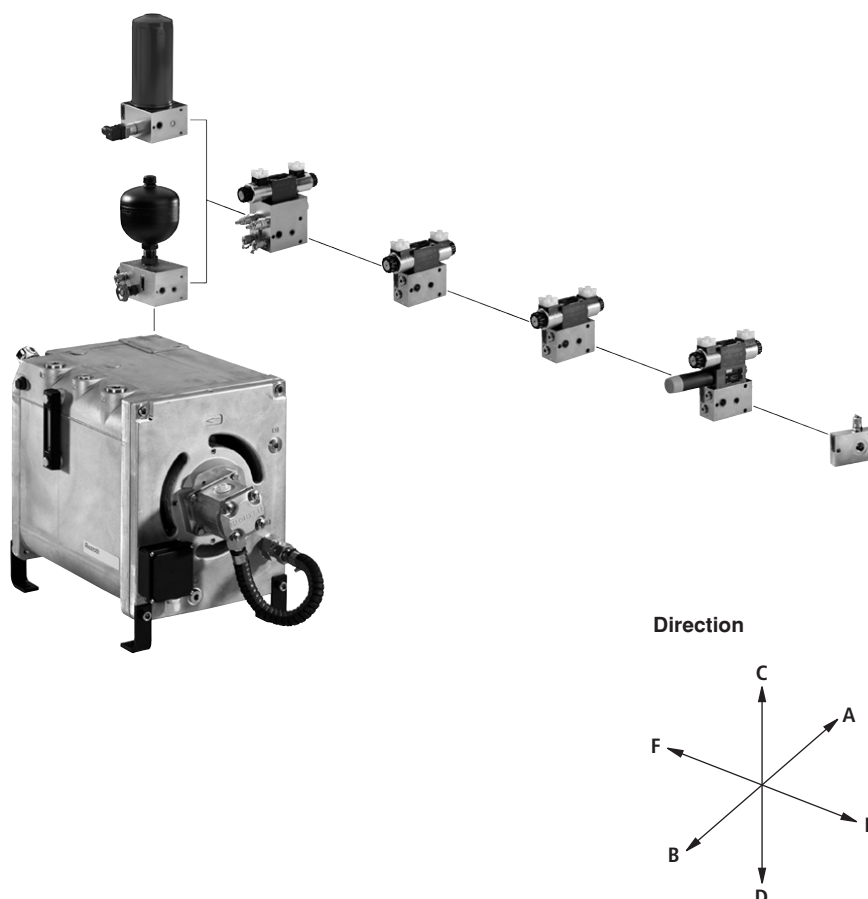
1) e.g. – Material no. of the attached control
– Special version

Mounting IH15B control module

The control modules for the UPE5 drive module serves the realization of complete hydraulic controls. They can be fitted and mounted individually.

The filter **or** accumulator safety module establishes the connection of the hydraulic control to port K2 of the drive module.

The IH15B control modules (in this connection see data sheet 51156) with the connection modules can be attached to the filter **or** accumulator safety module.



Project planning information

The entire length of the IH15B control should not exceed the length of the UPE5 drive module. Maximum recommended total length $l = 500$ mm. Please consult us if the entire length of the necessary control is longer.

Technical Data (For applications outside these parameters, please consult us!)

general

Weight (without hydraulic fluid and pump ¹⁾)	kg	75
Direction of rotation		Clockwise

hydraulic

Hydraulic fluid		Mineral oil HLP according to DIN 51524 part 2 Please observe our regulations according to data sheet 07075!
Hydraulic fluid temperature range	°C	-10 to +70 (admissible viscosity range of the pump and the valves must be observed!)
Viscosity range	mm ² /s	See viscosity range of the pump and the valves
Max. admissible degree of contamination of the hydraulic fluid Cleanliness class according to ISO 4406 (c)		Class 20/18/15 ²⁾

¹⁾ For the pump weights see data sheets 10089, 10213, 10515, 10522, 92712 and 92713.

²⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration

prevents faults and at the same time increases the service life of the components.

For selecting the filters, see data sheet 51156.

Selection table for pump and electric motor with $n = 1450 \text{ min}^{-1}$

Axial piston variable displacement pump ³⁾	$q_{V\max}$ l/min	p_{\max} bar	P kW
A10VSO10DFR1/52R-PPA14N00 max. operating pressure $p_{\max} = 220 \text{ bar}$	15.0	70	2.20
		95	3.00
		125	4.00
	4.0	220	2.20
	5.5		3.00
	7.5		4.00
A10VSO18DFR1/31R-PPA12N00 max. operating pressure $p_{\max} = 250 \text{ bar}$	27.0	40	2.20
		50	3.00
		70	4.00
	4.0	250	2.20
	5.5		3.00
	7.5		4.00
Internal gear pump	$q_{V\max}$ l/min	p_{\max} bar	P kW
PGF2-2X/006RE01VE4	9.4	110	2.20
		150	3.00
		200	4.00
PGF2-2X/008RE01VE4	11.9	90	2.20
		120	3.00
		160	4.00
PGF2-2X/011RE01VE4	16.0	65	2.20
		90	3.00
		120	4.00
PGF2-2X/013RE01VE4	19.3	55	2.20
		75	3.00
		100	4.00
PGF2-2X/016RE01VE4	23.2	45	2.20
		60	3.00
		80	4.00

External gear pump	$q_{V\max}$ l/min	p_{\max} bar	P kW
AZPF-1X-004RAB20MB	5.8	180	2.20
		245	3.00
		250	4.00
AZPF-1X-005RAB20MB	7.9	130	2.20
		180	3.00
		250	4.00
AZPF-1X-008RAB01MB	11.8	90	2.20
		120	3.00
		200	4.00
AZPF-1X-011RAB01MB	16.0	65	2.20
		90	3.00
		140	4.00
AZPF-1X-016RAB01MB	23.2	45	2.20
		60	3.00
		100	4.00
AZPF-1X-022RAB01MB	31.9	40	2.20
		55	3.00
		75	4.00

³⁾ The axial piston variable displacement pumps can - within their maximum values (e.g. A10VSO10DFR1/52R-PPA14N00, $p_{\max} = 250 \text{ bar}$, $q_{V\max} = 15 \text{ l/min}$) - be operated with all values (e.g. A10VSO10DFR1/52R-PPA14N00, $p_{\max} = 180 \text{ bar}$, $q_{V\max} = 8 \text{ l/min}$ and $P_{\text{Motor}} = 3.0 \text{ kW}$) if the admissible power of the electric motor is not exceeded.

Selection table for pump and electric motor with $n = 1450 \text{ min}^{-1}$

Vane pump ¹⁾	$q_{V\max}$ l/min	p_{\max} bar	P kW
PV7-1X/10-14RE01MC0-16 max. operating pressure $p_{\max} = 160 \text{ bar}$	21.0	50	2.20
		65	3.00
		90	4.00
	6.5	160	2.20
	9.0		3.00
	12.0		4.00
PV7-1X/10-20RE01MC0-10 max. operating pressure $p_{\max} = 100 \text{ bar}$	29.0	35	2.20
		50	3.00
		65	4.00
	10.5	100	2.20
	14.5		3.00
	19.0		4.00
PV7-1X/16-20RE01MC0-16 max. operating pressure $p_{\max} = 160 \text{ bar}$	29.0	35	2.20
		50	3.00
		65	4.00
	6.5	160	2.20
	9.0		3.00
	12.0		4.00
PV7-1X/06-10RA01MA0-10 max. operating pressure $p_{\max} = 100 \text{ bar}$	14.5	70	2.20
		100	3.00
		100	4.00
	10.5	100	2.20
	14.5		3.00
	14.5		4.00
PV7-1X/06-14RA01MA0-07 max. operating pressure $p_{\max} = 70 \text{ bar}$	20.0	50	2.20
		70	3.00
		70	4.00
	15.0	70	2.20
	20.0		3.00
	20.0		4.00

Vane pump ¹⁾	$q_{V\max}$ l/min	p_{\max} bar	P kW
PV7-2X/20-20RA01MA0-10 max. operating pressure $p_{\max} = 100 \text{ bar}$	29	35	2.20
		50	3.00
		65	4.00
	10.5	100	2.20
	14.5		3.00
	19.0		4.00
PV7-2X/20-25RA01MA0-10 max. operating pressure $p_{\max} = 100 \text{ bar}$	36	30	2.20
		40	3.00
		55	4.00
	10.5	100	2.20
	14.5		3.00
	19.0		4.00

¹⁾ The vane pumps can - within their maximum values (e.g. PV7-1X/10-14RE01MC0-16, $p_{\max} = 160 \text{ bar}$, $q_{V\max} = 21 \text{ l/min}$) - be operated with all values (e.g. PV7-1X/10-14RE01MC0-16, $p_{\max} = 80 \text{ bar}$, $q_V = 13 \text{ l/min}$ and $P_{\text{Motor}} = 2.2 \text{ kW}$) if the admissible power of the electric motor is not exceeded.

Electric motor

The electric motor is designed for the mode of operation according to VDE 0530 part 1 (EN 60034) for continuous operation S1 within the rated power range. The electric motor complies with insulation class F and protection class IP 55.

The electric motor is to be connected so that it rotates in clockwise direction (clockwise direction of rotation).

It can be used at power mains with the frequency 50 Hz or 60 Hz without modification.

Technical Data (For applications outside these parameters, please consult us!)

Voltage (other voltage values on request)	U	V	400 / 690 $\pm 6\%$ Δ/Y
Frequency	f	Hz	50 / 60
Mode of operation			S1 continuous operation
Insulation class			F (winding)
Protection class according to VDE 0530 / EN 60034			IP 55
Number of poles			4

Frequency 50 Hz

Power kW	Speed min ⁻¹	Power factor cos ϕ	Rated current with 400 Volt
2.2	1440	0.77	5.2 A
3.0	1415	0.76	7.0 A
4.0	1390	0.73	9.8 A

Frequency 60 Hz

Power kW	Speed min ⁻¹	Power factor cos ϕ	Rated current with 400 Volt
2.2	1710	0.84	4.8 A
3.0	1700	0.83	6.4 A
4.0	1680	0.77	9.3 A

Electromagnetic compatibility of devices (EMVG)

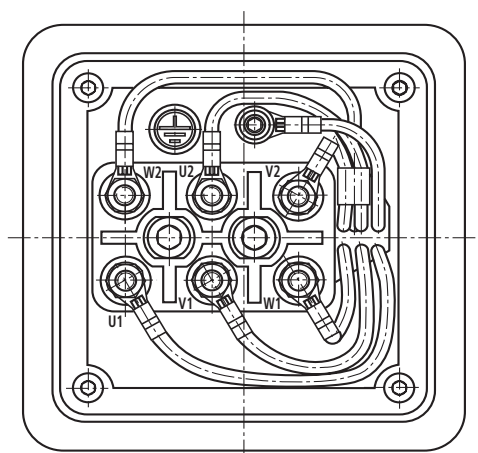
According to the "Act on the electromagnetic compatibility of devices" (§2, subsection 4) and the directive 89/336 EEC, the drive module is no device that is ready for operation.

In order to avoid electromagnetic interferences that might occur, an interference suppression element e.g. type 23 050, 3 x 400 VAC, 50 - 60 Hz by the company Murr-Elektronik (D-71570 Oppenweiler) is recommended.

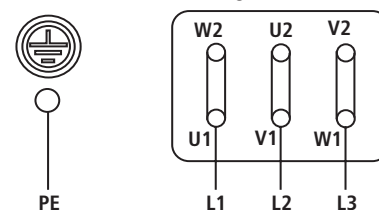
Terminal assignment

Terminal assignment in the terminal box at the drive module

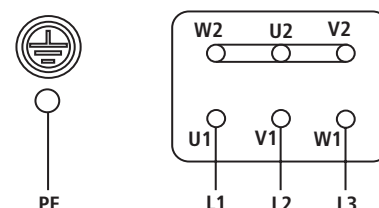
Factory-side:



Customer-side: Δ triangle $U = 400$ V

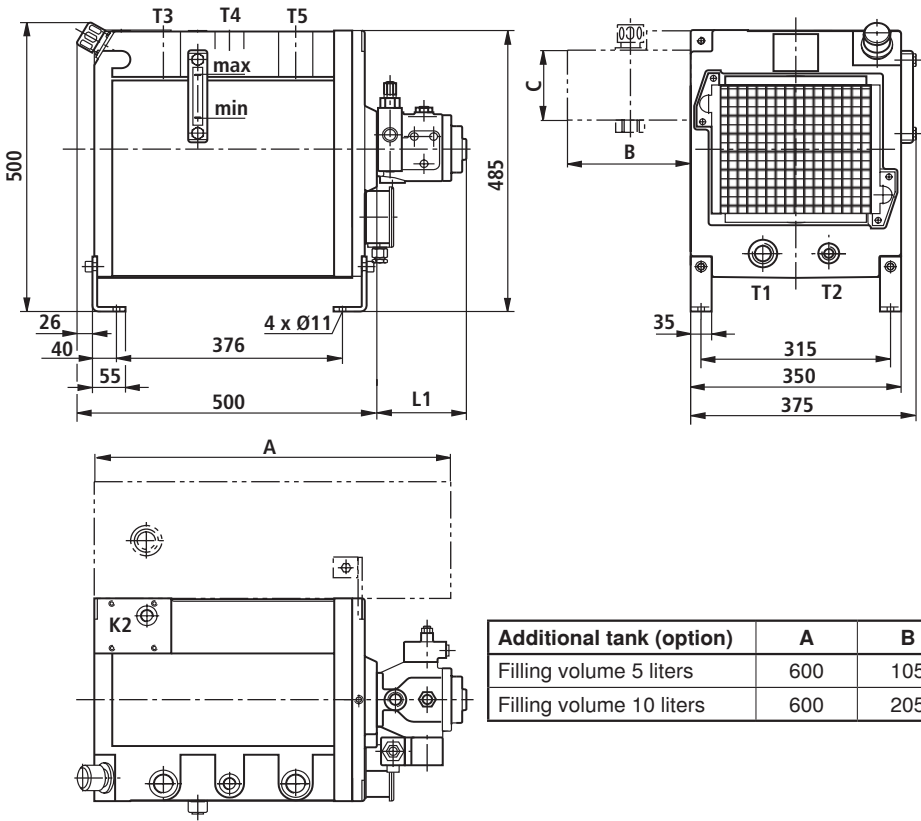


Customer-side: Y star $U = 690$ V



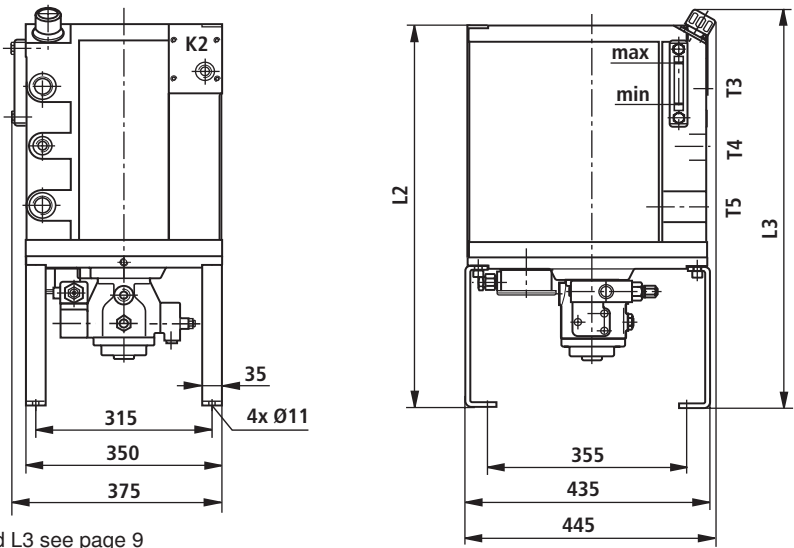
Unit dimensions: (dimensions in mm)

Installation variant: Horizontal mounting



Additional tank (option)	A	B	C
Filling volume 5 liters	600	105	122
Filling volume 10 liters	600	205	122

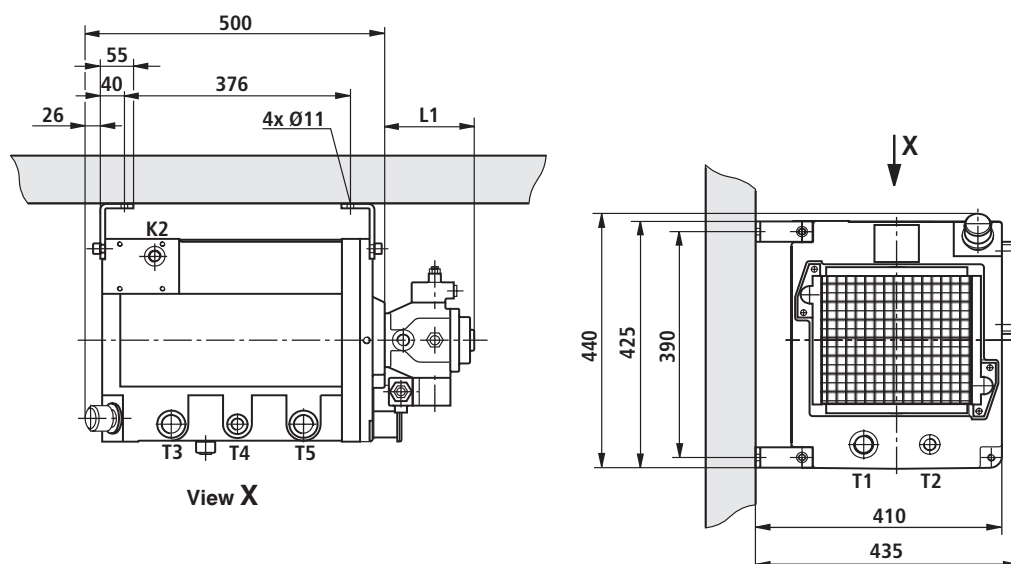
Installation variant: Vertical mounting



Dimensions L1, L2 and L3 see page 9

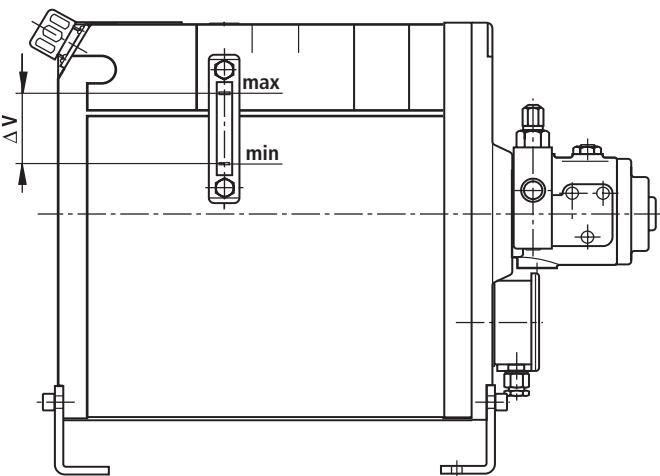
Unit dimensions (dimensions in mm)

Installation variant: Wall mounting

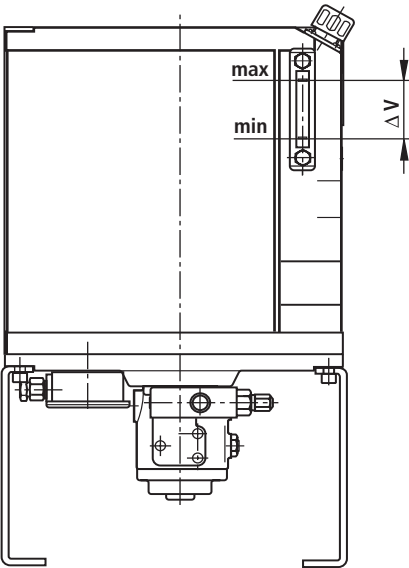


Pump type	Nominal dimension		
	L1	L2	L3
Axial piston variable displacement pump			
A10VSO10DFR1/52R-PPA14N00	164	725	755
A10VSO18DFR1/31R-PPA12N00	195	705	735
Internal gear pump			
PGF2-2X/006RE01VE4	114	630	660
PGF2-2X/008RE01VE4	117.5	705	735
PGF2-2X/011RE01VE4	123	705	735
PGF2-2X/013RE01VE4	128	705	735
PGF2-2X/016RE01VE4	133	705	735
External gear pump			
AZPF-1X-004RAB20MB	85	630	660
AZPF-1X-005RAB20MB	86	630	660
AZPF-1X-008RAB01MB	90	630	660
AZPF-1X-011RAB01MB	95	630	660
AZPF-1X-016RAB01MB	103	630	660
AZPF-1X-022RAB01MB	115	630	660
Vane pump			
PV7-1X/10-14RE01MC0-16	149	705	735
PV7-1X/10-20RE01MC0-10	149	705	735
PV7-1X/16-20RE01MC0-16	165	725	755
PV7-1X/06-10RA01MA0-10	101	630	660
PV7-1X/06-14RA01MA0-07	101	630	660
PV7-2X/20-20RA01MA0-10	135	705	735
PV7-2X/20-25RA01MA0-10	135	705	735

Filling and sampling volume (in liters)



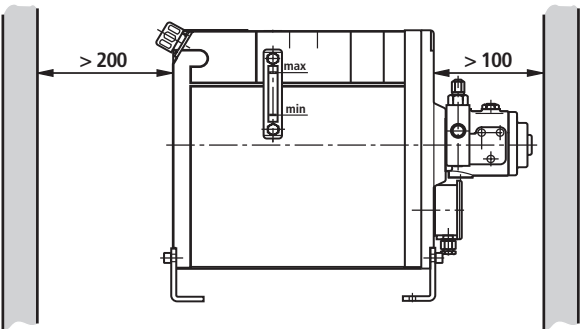
Installation variant: Horizontal mounting and wall mounting



Installation variant: Vertical mounting

	Installation variant: Horizontal mounting and wall mounting	Installation variant: Vertical mounting
Filling volume	23	26
Sampling volume	4.5	3.5
Sampling volume Switching point level switch	3.5	2.0

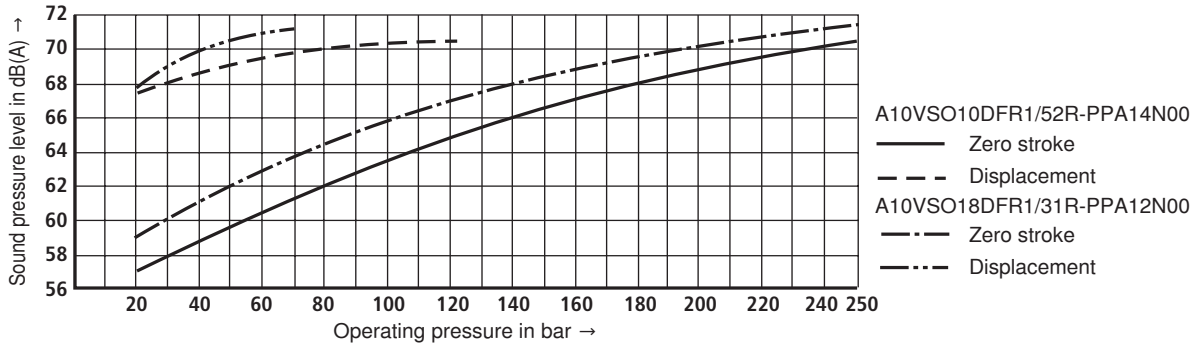
Installation information (in mm)



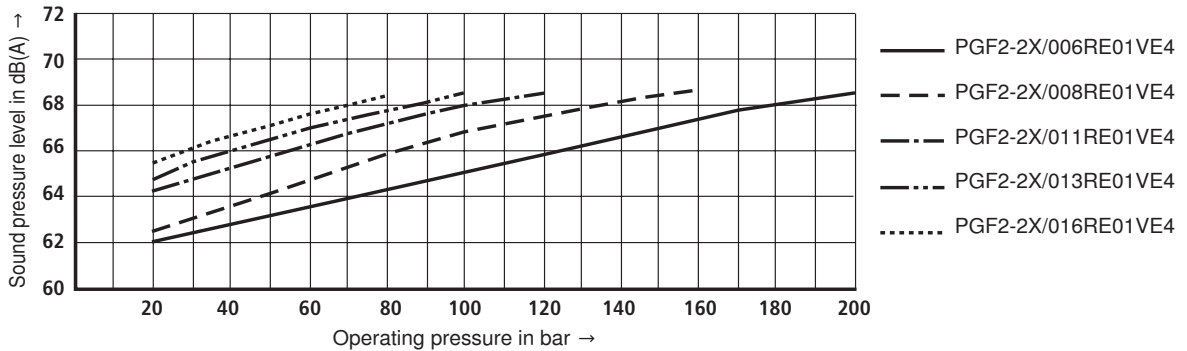
Necessary minimum distance to the wall for perfect cooling.

Sound pressure level (measured with $n = 1450 \text{ min}^{-1}$, $\nu = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)

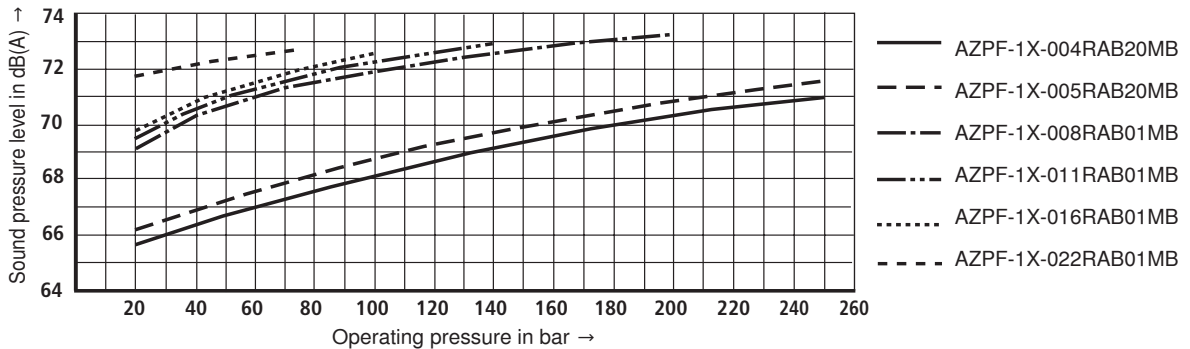
Sound pressure level for axial piston variable displacement pump A10VSO (in this connection see data sheet 92712, 92713)



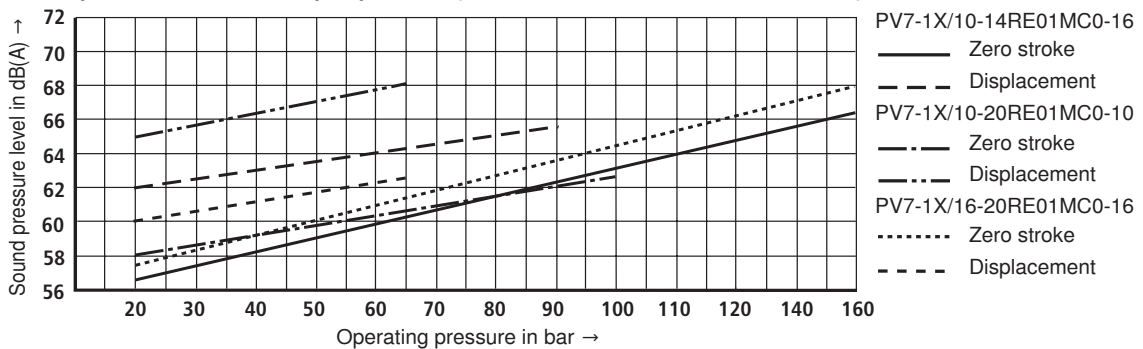
Sound pressure level for internal gear pump PGF2-2X (in this connection see data sheet 10213)



Sound pressure level for external gear pump AZPF-1X/ (in this connection see data sheet 10089)

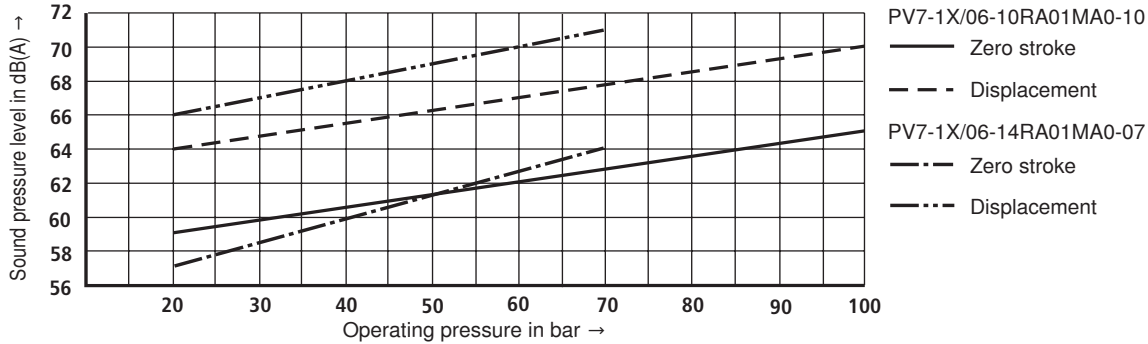


Sound pressure level for vane pump PV7-1X (in this connection see data sheet 10515)

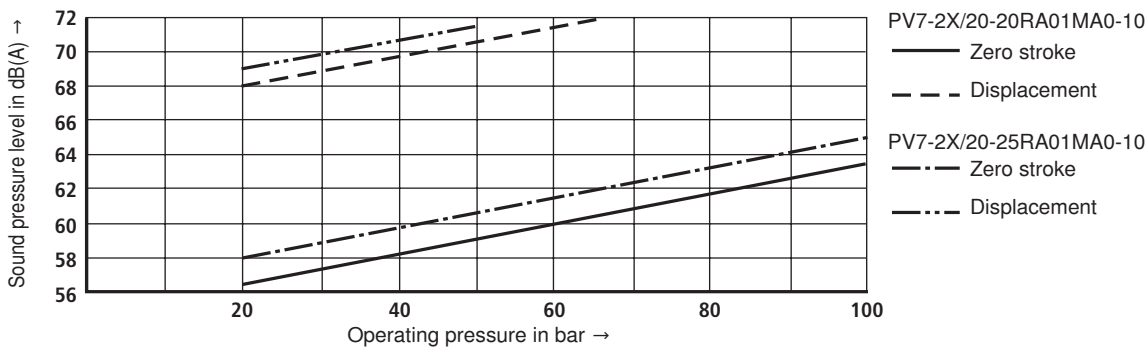


Sound pressure level (measured with $n = 1450 \text{ min}^{-1}$, $v = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50^\circ \text{C}$)

Sound pressure level for vane pump PV7-1X (in this connection see data sheet 10522)



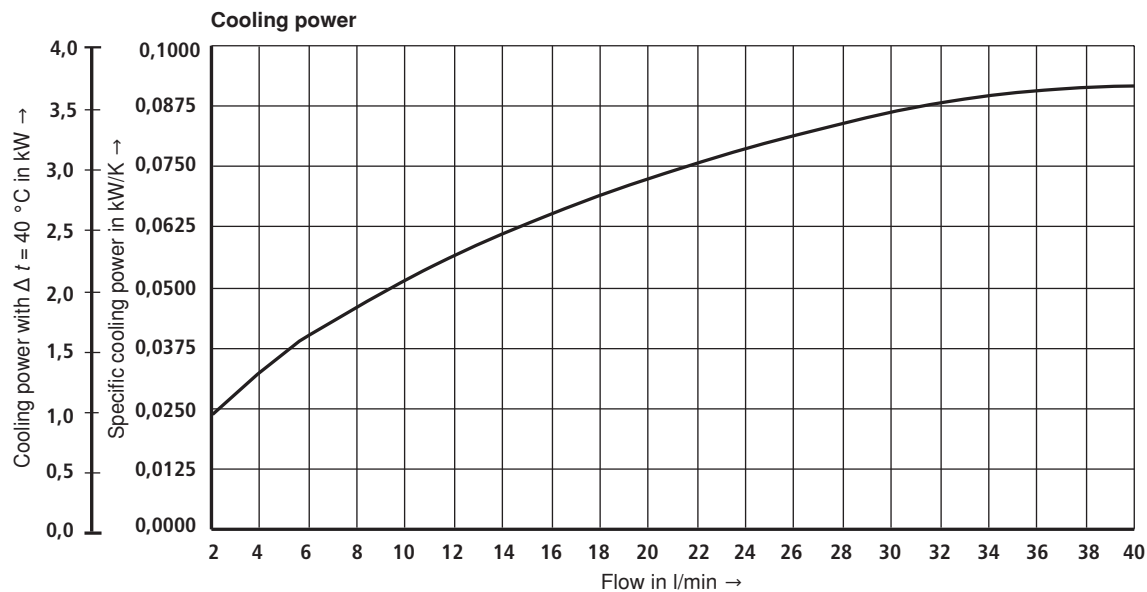
Sound pressure level for vane pump PV7-2X (in this connection see data sheet 10522)



Oil-air cooler ¹⁾

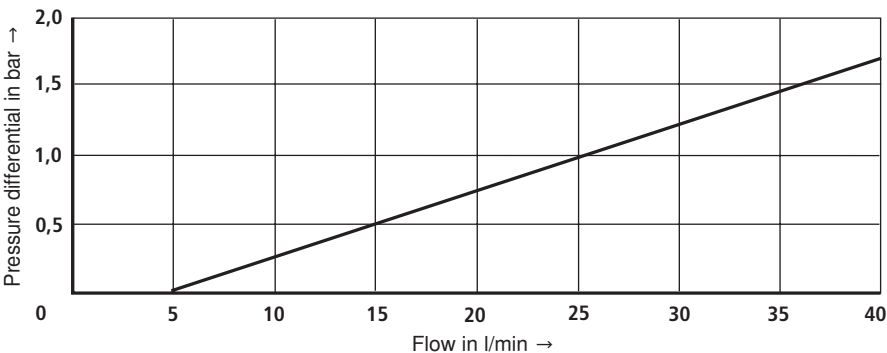
By means of the oil-air cooler, high power density (ratio between drive power and tank size) of the UPE 5 drive module is achieved.

In this way, the drive module with the oil-air cooler can be used in continuous operation. The maximum operating pressure of the oil-air cooler is $p_{\text{max}} = 10 \text{ bar}$.



¹⁾ On request, oil-water coolers are also possible!

$\Delta p - q_v$ characteristic curve (measured with $\nu = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)



Water cooler (optional)

Water cooler on request

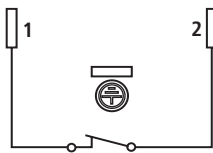
Level switch (option)

Function

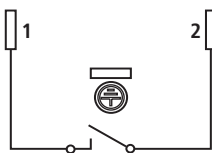
The level switch provides for electric monitoring of the hydraulic fluid filling level. If the minimum oil level is reached,

the contact opens and thus outputs a signal to the control.

Terminal assignment



Maximum filling level



Minimum filling level

Technical Data (For applications outside these parameters, please consult us!)

Maximum voltage	V	50 AC/DC
Maximum current consumption	A	0.25
Maximum power consumption	W	3.0
Protection class according to EN 60529		IP 65
Contact type		Normally closed contact

Temperature switch (option)

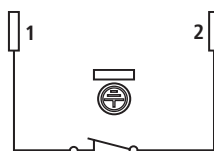
Function

By means of the temperature switch, the drive module is protected against operation with inadmissibly high hydraulic fluid temperatures. The temperature switch has a fixedly set switching point switching at a hydraulic fluid temperature of

70 °C. The switch-back hysteresis is ca. 15 K.

The temperature switch is screwed into port T2 in the tank.

Terminal assignment



Temperature ≤ 70 °C



Temperature > 70 °C

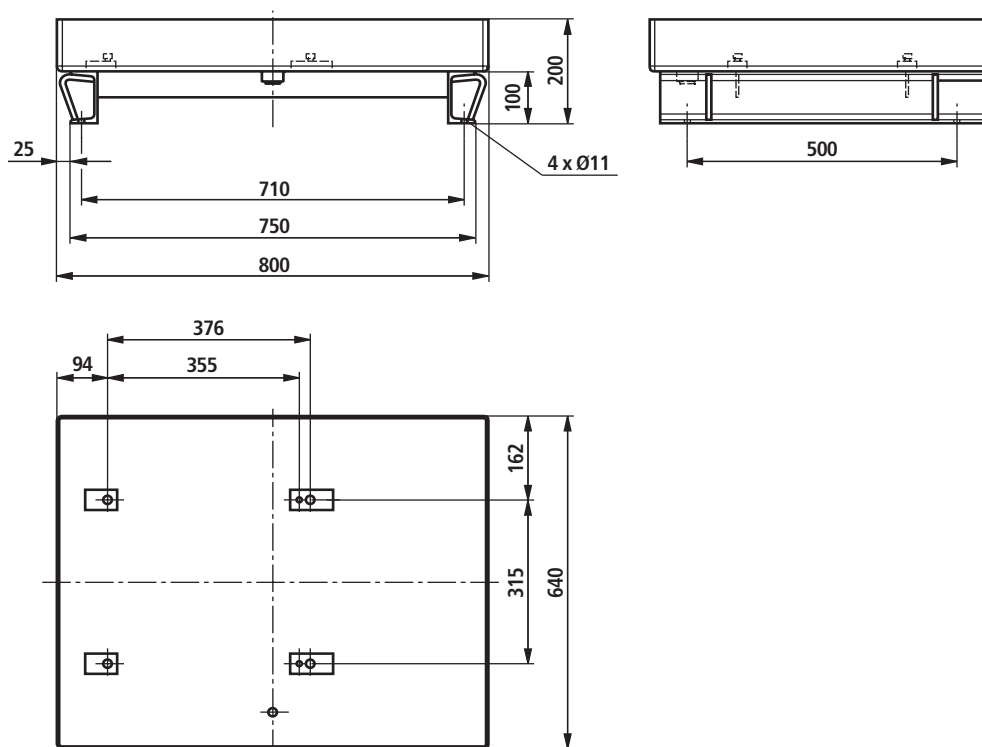
Technical Data (For applications outside these parameters, please consult us!)

Maximum voltage	V	230
Maximum current consumption	A	2
Protection class according to EN 60529		IP 65
Contact type		Normally closed contact

Oil tray (option) (dimensions in mm)

Material no. **R901271094**

Color: RAL 7035 "Light gray"



Commissioning information

- Check whether the drive module has been professionally connected to the machine to be operated (hydraulically and electrically).
- For the electrical connections of the motor, the washers and connection bridges included in the delivery must be used.
- The electric motor must be protected by equipment with overload relay.
The latter must be set to the rated current that is specified on the name / rating plate.
- When installing the drive module, the motor's direction of rotation must imperatively be observed, see arrow for direction of rotation. (Practical control: Hold a sheet of paper close to the cooler. It must be sucked in.)
- Only fill in the hydraulic fluid through a filter with the required minimum retention rate.
- Fill the drive module maximally to the upper edge of the inspection glass.
- The pump must in no case be operated without hydraulic fluid.
- Start up the pump without load and allow it to run at zero pressure for some seconds in order to provide for sufficient lubrication.
- The drive module may only be operated with the admissible data. It may moreover only be operated if it is in an unobjectionable condition.
- When carrying out works at the drive module, the system must be depressurized and de-energized.
- Unauthorized conversions or modifications which affect the safety and function are not permitted.
- Available protective devices must not be removed.
- The generally valid safety and accident prevention regulations must be observed and complied with.
- Keep the oil-air cooler clean and do not cover it as otherwise, the hydraulic fluid and the electric motor may overheat.
- The operating pressure of the oil-air cooler must not be exceeded.

Attention!

The drive module may heat up during operation

→ **Risk of injury!**

Settings, maintenance and service works at the drive module may only be carried out by authorized, trained and instructed personnel.