

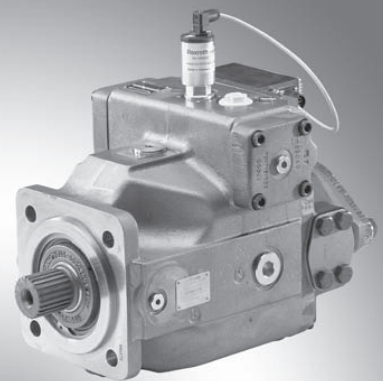
Pressure and flow control system

RE 30035/12.11
Replaces: 10.09

1/28

Type SYHDFEE-1X, SYHDFEC-1X ¹⁾

With axial piston variable displacement pump A4VSO
 Size 125 to 355
 Component series 1X
 Maximum operating pressure 350 bar



H7126/06

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Features

An SYHDFE.-1X control system is used for the electro-hydraulic control of swivel angle, pressure and power (partially optional, see pages 3 and 4) of an axial piston variable displacement pump.

The control system consists of the following components:

- A4VSO axial piston variable displacement pump optimized for the operation in the control system
- VT-DFP.-2X proportional valve as pilot valve with integrated electronics including inductive position transducer for valve position sensing
- Position transducer for sensing the swivel angle
- Pressure transducer with suitable signal level and dynamics (separate order)

¹⁾ Type SYHDFEn-2X is described in data sheet 62242.

Ordering code: Pump of the SYHDFE.-1X control system

SYHDFE.-1X/	125	R	-	V	Z	B	25	U99	-	0000	-	...
1	2	3		4	5	6	7	8		9		See following pages

Series

1	Control system with integrated analog electronics	SYHDFEE-1X
	Control system with integrated digital electronics	SYHDFEC-1X
	Variable-speed control system Sytronix DFE 5000 see data sheet 62242	SYHDFEn-1X

Size

		125	180	250	355
2	Displacement cm³	125	180	250	355

Direction of rotation looking at the drive shaft

3	Clockwise	●	●	●	●	R
	Counterclockwise	●	●	●	●	L

Hydraulic fluid

4	Mineral oil according to DIN 51524 (HL/HLP)	●	●	●	●	V
	HFC	●	●	●	●	F

Drive shaft variant

5	Cylindrical with key DIN 6885	●	●	●	●	P
	Splined shaft profile DIN 5480	●	●	●	●	Z

Connection flange

6	ISO 4-hole	●	●	●	●	B
---	------------	---	---	---	---	---

Connection for working lines

7	Port B and S: SAE, laterally displaced by 90 °, metric mounting thread, 2nd pressure port B1 vis-à-vis B – upon delivery closed by means of flange plate	●	●	●	●	25
---	--	---	---	---	---	----

Through-drive (see table page 18/19)

8	Universal through-drive, convertible, without hub, without intermediate flange closed by means of cover	●	●	●	●	U99
---	---	---	---	---	---	-----

Base pump variant

9	Standard (internal pilot oil)	●	●	●	●	0000
	External supply	●	●	●	●	0576

● = available

- = not available

 Preferred program

Ordering code: Pilot valve of the SYHDFEE control system

SYHDFEE-1X/	125	R	-	V	Z	B	25	U99	-	0000	-	A	0	A	0	V	-	*
1	2	3		4	5	6	7	8		9		10	11	12	13	14		15

Spool design

10	Standard	A
	4-groove spool e.g. for HFC	C

Valve, installation orientation

11	Integrated electronics parallel to the pump axis direction subplate	0
----	---	---

Additional functions closed-loop control

		A	B	C	D	
12	Selectable pressure controller (high signal)	●				A
	Power limitation adjustable at the OBE valve		●			B
	Power limitation adjustable via analog input			●		C
	Pressure controller that can be switched off (high signal)				●	D

Electronic assembly, option

13	Standard electronics with leakage oil compensation	●			●	0
	Standard electronics without leakage oil compensation	●	●	●	●	1

Actual pressure value input

(description of the plug-in connectors on page 13)

Plug-in connector

14	Current input 4...20 mA	X1	C
	Voltage input 0...10 V	X1	V
	Voltage input 1...10 V	X1	E
	Voltage input 0.5...5 V	X2	F

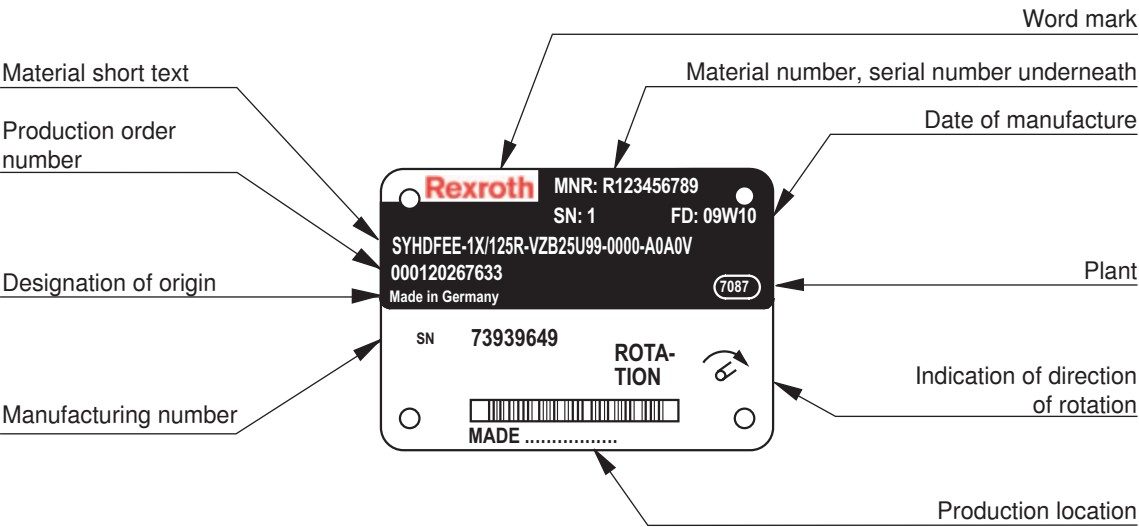
15	Further details in the plain text e.g. SO variant	
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Ordering code: Pilot valve of the SYHDFEC control system

SYHDFEC-1X/	125	R	-	V	Z	B	25	U99	-	0000	-	A	0	A	0	V	-	*
1	2	3		4	5	6	7	8		9		10	11	12	13	14		15

Spool design			
10	Standard	A	
	4-groove spool (e.g. for HFC fluids)	C	
Valve installation orientation			
11	Integrated electronics parallel to the pump axis direction subplate	0	
Additional functions			
12	Standard	A	
Electronic assembly, options			
13	Standard	0	
Actual pressure value input			
Parameter setting ex factory		Plug-in connector	
(description of the plug-in connectors on page 14)			
14	Current input 4...20 mA	X1	C
	Voltage input 0...10 V	X1	V
	Voltage input 1...10 V	X1	E
	Voltage input 0.5...5 V	X2	F
15	Further details in the plain text e.g. SO variant		

Example of a name plate



Notice:
For enquiries regarding the control system, material number, production order number, serial number, and date of manufacture are necessary.

Ordering code: Accessories

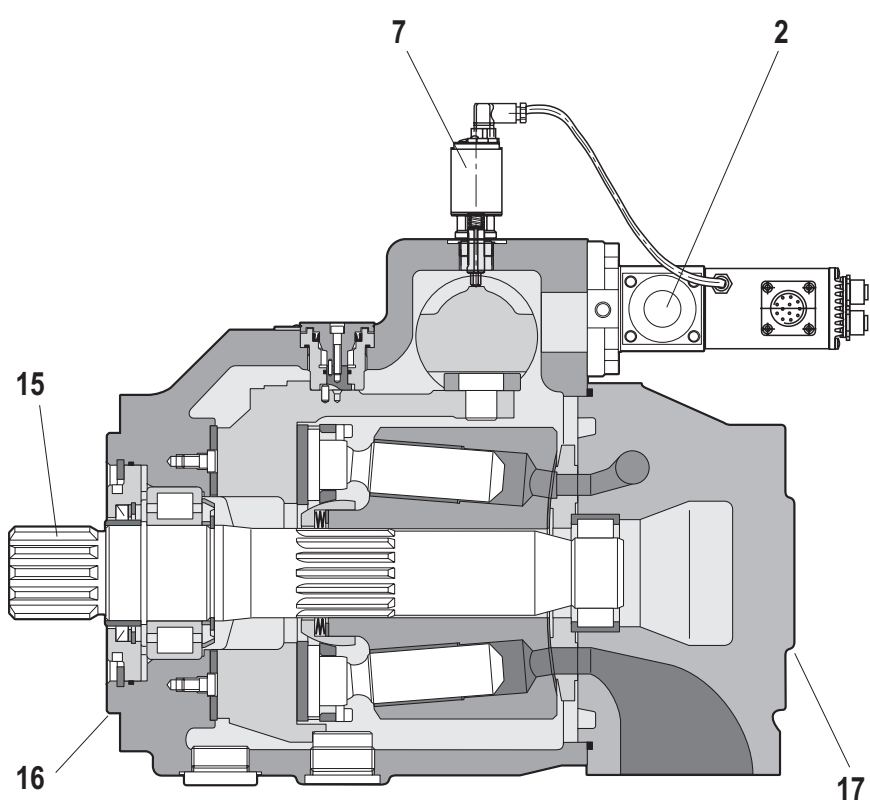
Version 10/2011, enquire availability

Accessory for SYHDFEE and SYHDFEC	Material number	Data sheet
Mating connector 12-pin for central connection X1 without cable (assembly kit)	R900884671	08006
Mating connector 12-pin for central connection X1 with cable set 2 x 5 m	R900032356	
Mating connector 12-pin for central connection X1 with cable set 2 x 20 m	R900860399	
Pressure transducer HM 12-1X measurement range 315 bar (4...20 mA)	R900199871	29933
Pressure transducer HM 13-1X measurement range 315 bar (0...10 V)	R900174374	29933
Pressure transducer HM 17-1X measurement range 315 bar (4...20 mA)	R900773065	30269
Pressure transducer HM 17-1X measurement range 315 bar (0.1...10 V)	R900773124	30269
Test device VT-PDFE-1-1X/V0/0	R900757051	29689-B
Compact power supply unit VT-NE32-1X	R900080049	29929

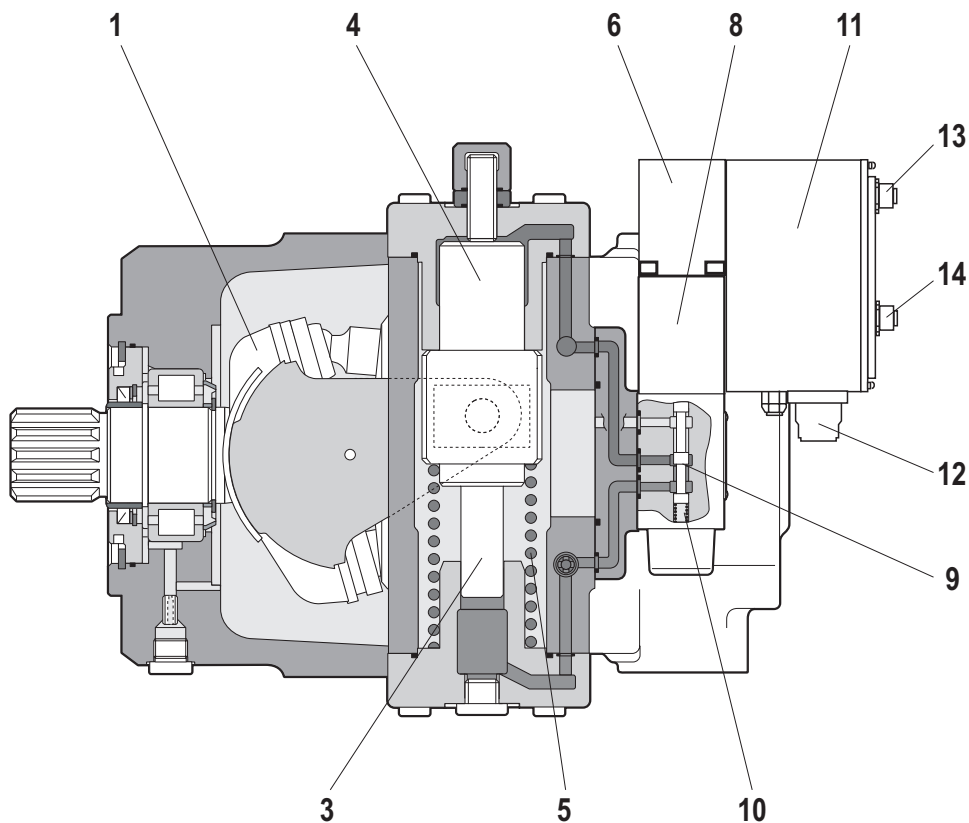
Accessories for SYHDFEC only	Material number	Data sheet
Converter USB/serial for laptops without serial interface VT-ZKO-USB/S-1-1X/V0/0	R901066684	
Cable for connecting a Win-PED PC (RS232) to the X2 interface length 3 m	R901156928	
T connector for the simultaneous connection of a Win-PED PC (RS232) and a pressure transducer at plug-in connector X2 (only necessary with actual pressure value input 0.5...5 V (feature 14 = F)	R901117164	
Mating connector for interface X3, M12, straight, can be connected independently, 5-pin, shielded, A-coded, cable diameter 6...8 mm	R901076910	

More accessories	Page	
Hubs for through-drives	18	
Hubs for standard electric motor coupling	26	

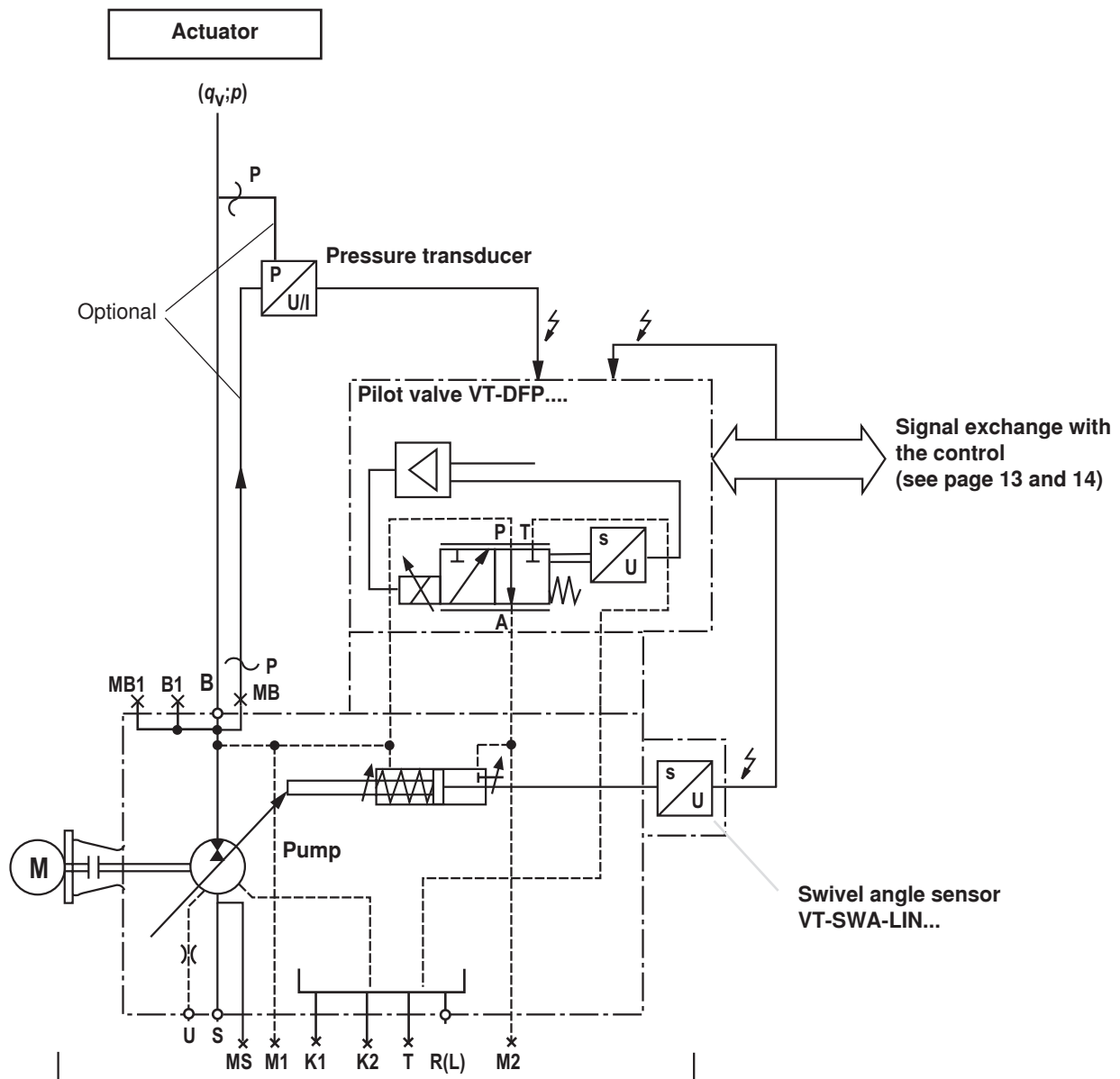
Cross section



- 1 Swash plate
- 2 Pilot valve
- 3 Counter piston
- 4 Actuating piston
- 5 Spring
- 6 Inductive position transducer
- 7 Swivel angle position sensor with integrated electronics VT-SWA-LIN
- 8 Proportional solenoid
- 9 Valve spool
- 10 Spring
- 11 Integrated electronics
- 12 Connector X1
- 13 Connector X2 (for SYHDFEE only with actual pressure value input F, for SYDFEC always available)
- 14 Mating connector X3 for connecting the CAN bus (only available with SYDFEC)
- 15 Drive shaft
- 16 Connection flange
- 17 Subplate with through-drive U99, without hub, without intermediate flange



Schematic diagram: Actuating system supplied internally



- | | |
|---------------|---|
| S | Suction port |
| K1, K2 | Flushing port |
| T | Fluid drain |
| MB | Measuring port operating pressure |
| MS | Measuring port suction pressure |
| M1, M2 | Measuring port control chamber pressure |
| R(L) | Fluid filling + bleeding (leakage port) |
| U | Flushing port |
| B | Pressure port |
| B1 | 2nd pressure port/additional port |
| MB1 | Measuring port operating pressure
Size 250/355: G1/4
Size 125/180: Blind flange 1 1/4 " with pressure
measuring port G1/4 attached to B1 |

When using the HM16-1X/...C13 pressure transducer:

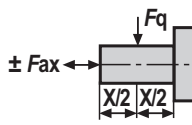
- Installation in MB (pump) in connection with electronic version "actual pressure value input F".
- For attaching an HM16-1X/...C13, an adapter from M14x1.5 to G1/4 (Mat. no. R900695665) is necessary.
- Due to the installation position, the HM16 cannot be used for all sizes without restrictions (replacement: HM17-1X/...-F... with extension cable).

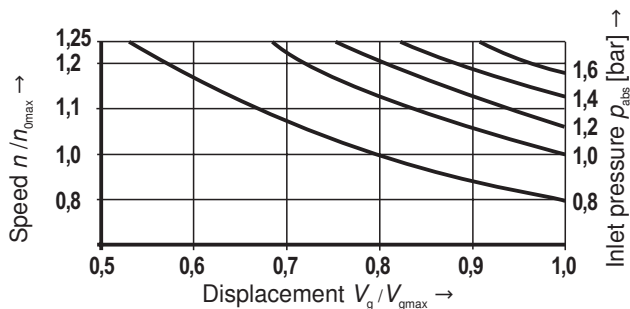
When using an external pressure transducer:

Installation in the B line (preferably close to the actuator) and electrical connection via the central connector X1

Explanation in the operating instructions (see page 26)

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

mechanical and hydraulic					
Size / displacement	$V_{g \max}$ [cm ³]	125	180	250	355
Maximum speed ¹⁾	$n_{0 \max}$ [min ⁻¹]	1800	1800	1800	1500
Minimum speed	$n_{\min}$	50 min ⁻¹			
Max. flow (displacement)					
at max. speed	$q_{v0 \max}$ [l/min]	225	324	450	533
with $n_E = 1500 \text{ min}^{-1}$	[l/min]	186	270	375	533
Max. power ($\Delta p = 350 \text{ bar}$)					
at max. speed	$P_{0 \max}$ [kW]	131	189	263	311
with $n_E = 1500 \text{ min}^{-1}$	[kW]	109	158	219	311
Max. torque ($\Delta p = 350 \text{ bar}$)	$T_{\max}$ [Nm]	696	1002	1391	1976
Max. admissible drive torque					
Key	T_{Total} [Nm]	1392	1400	2300	3557
Splined shaft Z overall torque	T_{Total} [Nm]	1392	2004	2782	3952
Max. admissible through-drive torque	T_D [Nm]	696	1002	1391	1976
 Drive shaft load – Max. admissible axial force – Max. admissible radial force ²⁾					
	$F_{\text{ax max}}$ [N]	1000	1400	1800	2000
	F_q [N]	1600	2000	2000	2200
Weight without filling quantity	m [kg]	88	102	184	207
Moment of inertia around drive axis	[kgm ²]	0.03	0.055	0.0959	0.19
Filling quantity, housing	[l]	5	4	10	8
Maximum admissible operating pressure ³⁾	$p_{\max}$	350 bar			
Minimum operating pressure	$p_{\min}$	≥ 20 bar			
Admissible inlet pressure	p	0.8...30 bar			
Hydraulic fluid		Mineral oil (HL, HLP) according to DIN 51524 HFC optional (see ordering code)			
Hydraulic fluid temperature range	°	–20...+70 °C			
Maximum admissible degree of contamination of the hydraulic fluid according to ISO 4406		Class 18/16/13 (for particle size ≤ 4/6/14 μm)			



¹⁾ The values are applicable at an absolute pressure of 1 bar in suction port S. With a reduction of the displacement or an increase in the inlet pressure, the speed can be increased according to the following characteristic curve. With a reduced inlet pressure, the speed is to be reduced.

²⁾ In case of higher radial forces, please consult us.

³⁾ When using HFC fluids, also see data sheet 92053.

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

electric				
Type			SYHDFEE...2X	SYHDFEC...2X
Operating voltage U_B			24 VDC +40 % -5 %	24 VDC +40 % -5 %
Operating range (short-time operation)				
Upper limit $U_{B(t)max}$			35 V	
Lower limit $U_{B(t)min}$			21 V	
Current consumption (in static control operation)				
Rated current I_{Rated}			0.6 A	
Maximum current I_{max}			1.25 A	
Inputs	Actual pressure value input X1; pin 10 and 11	U or I	Determination by means of ordering code	Parameterizable: 0...20 mA; 4...20 mA; 0...10 V; 0...5 V; 0.5...5 V; 0.1...10 V; 1...10 V
	Analog current inputs, load	R_B	100 Ω	100 Ω
	Analog voltage inputs	R_E	≥ 50 k Ω	≥ 100 k Ω
	Digital inputs	Logic 0	≤ 0.6 V	≤ 8 V
		Logic 1	≥ 21 V	≥ 14 V
Outputs	$p_{actual} / U_{OUT}1^{1)}$	U_A I_{max}	0...10 V 1.5 mA	± 10 V 2 mA
	$\alpha_{actual} / U_{OUT}2^{2)}$	U_A I_{max}	± 10 V 1.5 mA	± 10 V 2 mA
	Digital outputs	Logic 0	$U_a < 1$ V	
		Logic 1	$U_a \geq U_B - 5$ V; 10 mA (short-circuit-proof)	
	Ambient temperature range at the pump ϑ			0...60 °C
Storage temperature range (pump+electronics) ϑ			0...70 °C	0...70 °C
Electronics design			Integrated in the pilot valve (OBE)	
Electrical connection			See page 13	See page 14
Protection class according to EN 60529 Pump incl. pilot valve			IP 65 with mounted and locked plug-in connectors	
Power limitation			Optional	Yes

Notice:

For information on the environment simulation testing for the areas of EMC (electromagnetic compatibility), climate and mechanical load, see data sheet 30030-U.

^{1, 2)} With SYDFEC, the outputs are parameterizable, condition as supplied see page 14

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

Bearing flushing

With the following operating conditions, flushing of the bearing is necessary for safe continuous operation:

- Applications with special fluids (not mineral fluids) due to limited lubricity and tight operating temperature range
- Operation with boundary conditions of temperature and viscosity with mineral oil operation

With vertical installation (drive shaft upwards), bearing flushing is recommended for lubricating the front bearing and the shaft seal ring.

The bearing is flushed using port "U" in the area at the front flange of the variable displacement pump. The flushing fluid flows through the front bearing and exits with the pump leakage at the leakage port.

For the individual sizes, the following flushing quantities are recommended:

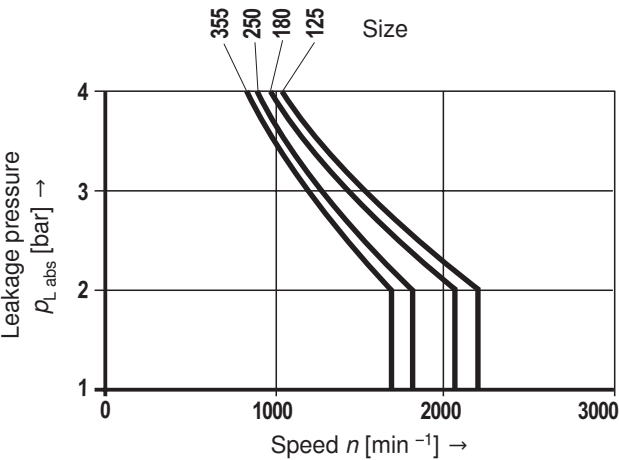
Size	125	180	250	355
Recommended Flushing quantity q_{Sp} [l/min]	5	7	10	15

The specified flushing quantities result in a pressure differential between port "U" (including fitting) and the leakage chamber of approx. 2 bar (series 1) and approx. 3 bar (series 3).

When using the external bearing flushing, the throttle screw in port U has to be screwed-in to the stop.

Leakage pressure

The admissible leakage pressure (housing pressure) depends on the speed (see diagram).



Max. leakage pressure (housing pressure)

$p_{L\ abs\ max} = 4\ \text{bar absolute}$

These specifications are guidelines; under special operating conditions, a limitation may become necessary.

Flow direction

S → B

Closed-loop control quality

Notices:

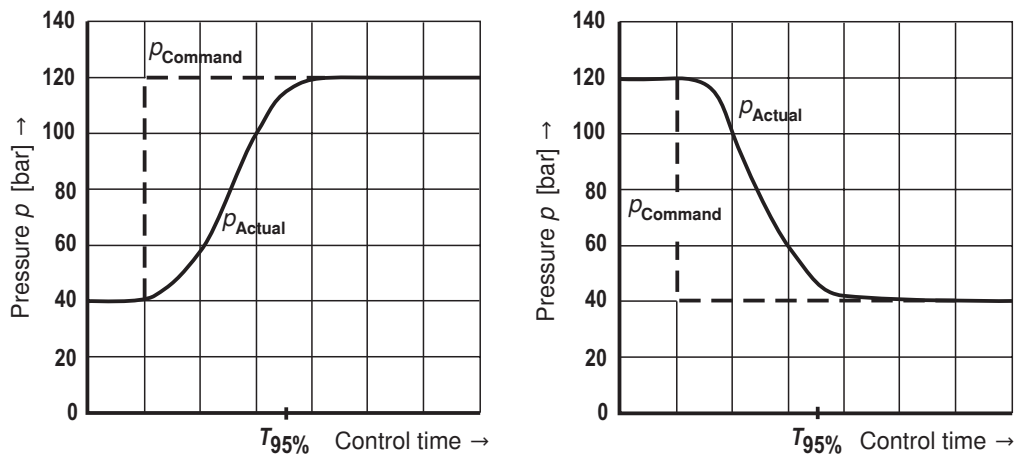
- The specified values are only valid when using the system-related components specified in this data sheet.

	Swivel angle control	Pressure control ¹⁾
Linearity tolerance	≤ 1.0 %	≤ 1.5 %
Temperature error	≤ 0.5 % / 10 K	≤ 0.5 % / 10 K
Hysteresis	Typically 0.3 %	≤ 0.2 %
Repeatability	≤ 0.2 %	≤ 0.2 %

¹⁾ without considering the pump pulsation

Transition function with pressure command value step with spool design "A"

The specified curve shapes and control times refer to a drive speed of 1500 rpm and are only reached with an optimization of the pressure controller.



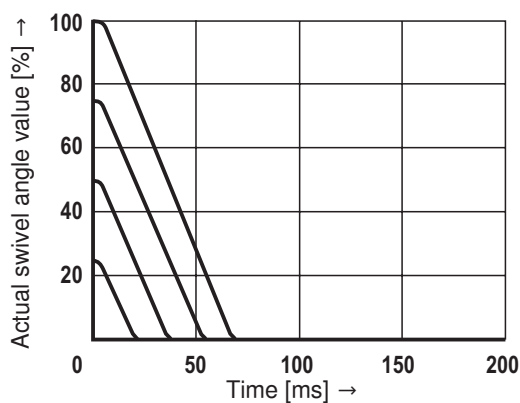
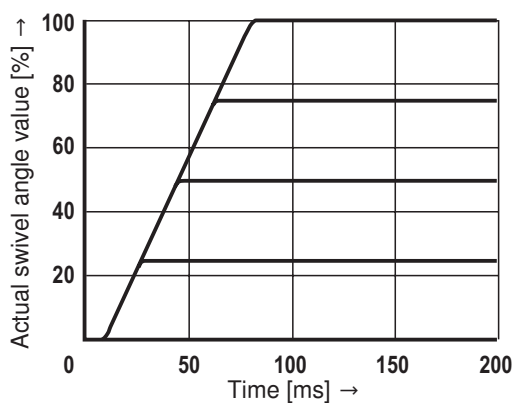
$T_{95\%}$ in ms with a connected hydraulic fluid volume (lines and actuators)

Hydraulic fluid volume	$T_{95\%}$
5 – 10 l	200 ms
15 – 25 l	250 ms

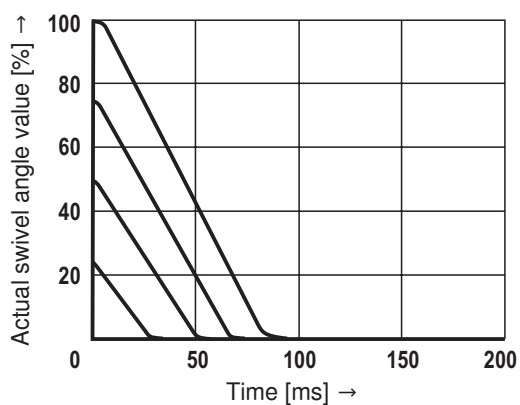
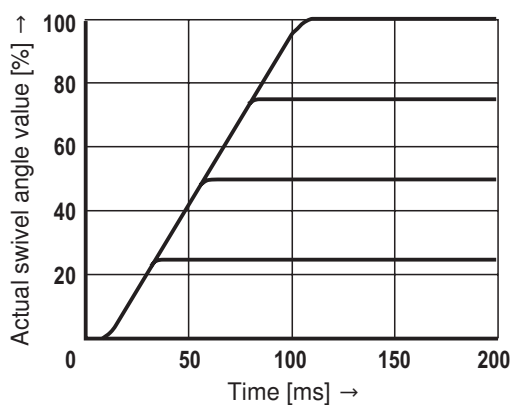
For pressures up to 40 bar, the values of the response times are larger.

Transition function with swivel angle command value step with spool design "A"

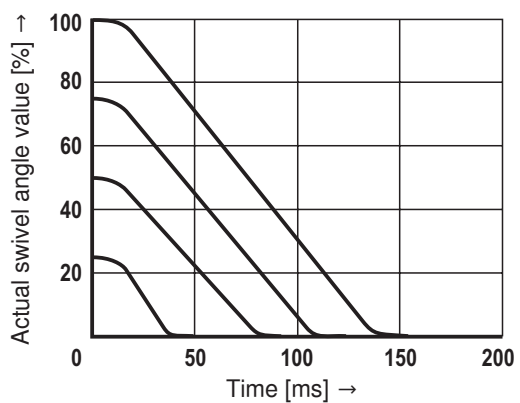
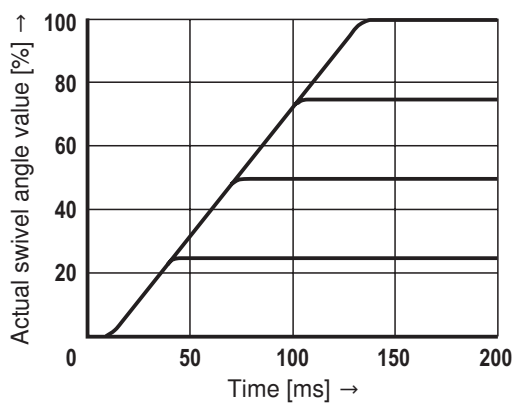
Size 125 $p = 100$ bar



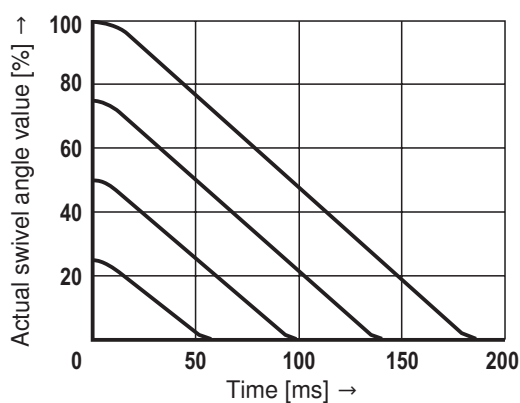
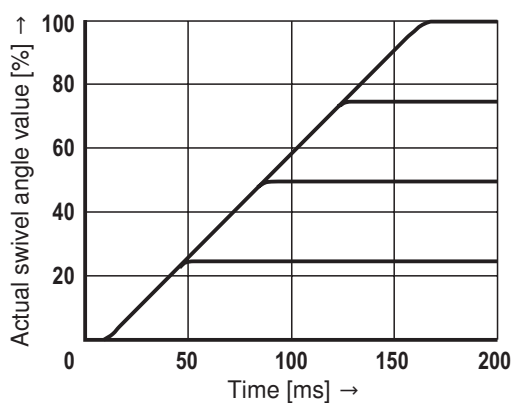
Size 180 $p = 100$ bar



Size 250 $p = 100$ bar



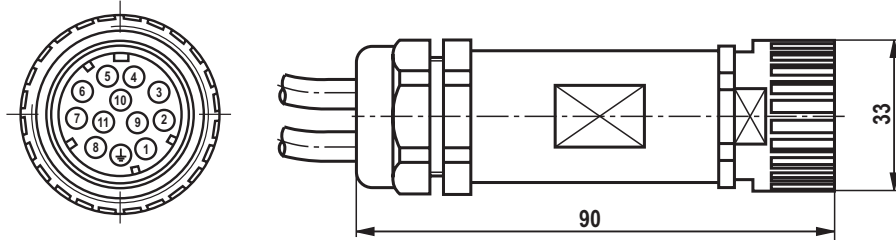
Size 355 $p = 100$ bar



Electrical connection: SYHDFEE-1X

X1: Central connection

Mating connector according to EN 175201-804 (12-pin), ordering code see section Accessories on page 5



Assignment of connector or mating connector and cable set

Pin	Signal	Description	Signal direction	Type of signal	Assignment in the cable set (accessories)	
1	$+U_B$	Voltage supply	IN	24 V DC	1	Supply line 3 x 1.0 mm ²
2	0 V = L0	Reference potential for the voltage supply	-		2	
PE	Earth	Earthing connection for the electronics	-		Green/yellow	
3	Fault	Signals failures, e.g. cable break command / actual values, controller monitoring (logic 0 = error)	OUT	Logic 24 V	White	Supply line 10 x 0.14 mm ² shielded (one end of the shield must be connected to the control!)
4	M0	Reference potential for analog signals	-		Yellow	
5	α_{Command}	Swivel angle command value	IN	Analog ± 10 V	Green	
6	α_{Actual}	Actual swivel angle value normalized	OUT	Analog ± 10 V	Violet	
7	p_{Command}	Pressure command value	IN	Analog 0...10 V	Pink	
8	p_{Actual}	Actual pressure value normalized	OUT	Analog 0...10 V	Red	
9		Function depends on electronics type and additional function, see below			Brown	
10	Actual pressure value H	Actual pressure value input: Signal level depends on feature 14 of the ordering code With type "F" (0.5...5 V) reserved	IN	Analog	Black	
11	Actual pressure value L		-	Analog	Blue	
n.c.					Gray	

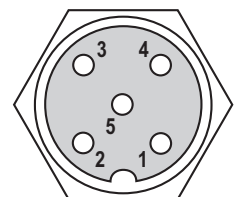
Functions at pin 9

Pin	Additional function	Function dependent on feature 12 of the ordering code (see page 3)	Signal direction	Type of signal
9	...A...	Switching to different oil volume adjustment (switch TD)	IN	Logic 24 V
	...B...	Power limitation active	OUT	Logic 24 V
	...C...	Command value of power limitation	IN	Analog 0...10 V
	...D...	Switch off pressure controller	IN	Logic 24 V

X2: Connection of pressure transducer HM 16 (mating connector M12)

Pin	Signal HM 16	Pin	
1	OUT, $+U_B$	2	n.c.
3	Reference L0		
4	IN, analog, 0.5 to 5 V DC	5	n.c.

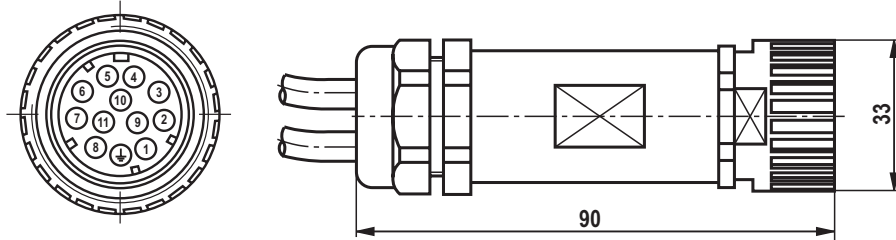
Top view
Mating
connector



Electrical connection: SYHDFEC-1X

X1: Central connection

Mating connector according to EN 175201-804 (12-pin), ordering code see section Accessories on page 5



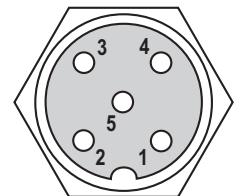
Assignment of connector or mating connector and cable set

Pin	Signal	Description	Signal direction	Type of signal	Assignment in the cable set (accessories)	
1	+ U_B	Voltage supply	IN	24 V DC	1	Supply line 3 x 1.0 mm ²
2	0 V = L0	Reference potential for the voltage supply	-		2	
PE	Earth	Earthing connection for the electronics	-		Green/Yellow	
3	Fault	Signals failures, e.g. cable break command / actual values, controller monitoring (logic 0 = error)	OUT	Logic 24 V	White	Supply line 10 x 0.14 mm ² shielded (one end of the shield must be connected to the control!)
4	M0	Reference potential for analog signals	-		Yellow	
5	AI2	Analog input AI2 Standard: Swivel angle command value	IN	Analog ± 10 V	Green	
6	U_{OUT2}	Analog output Standard: Actual swivel angle value normalized	OUT	Analog ± 10 V	Violet	
7	AI1	Analog input AI1 Standard: Pressure command value	IN	Analog 0...10 V	Pink	
8	U_{OUT1}	Analog output Standard: Actual pressure value normalized	OUT	Analog ± 10 V	Red	
9	DI1	Digital input DI1	IN	Logic 24 V	Brown	
10	Actual pressure value H	Actual pressure value input: Signal level depends on feature 14 of the ordering code With type "F" (0.5...5 V) reserved	IN	Analog	Black	
11	Actual pressure value L		-	Analog	Blue	
n.c.					Gray	

X2: Connection of pressure transducer HM 16 and serial interface RS232 (mating connector M12)

Pin	Signal HM 16	Pin	Signal RS232
1	OUT, + U_B	2	RxD
3	Reference L0		
4	IN, analog, 0.5 to 5 V DC	5	TxD

Top view
Mating
connector



X3: Connection CAN bus and digital input 2 (DI2) (connector M12)

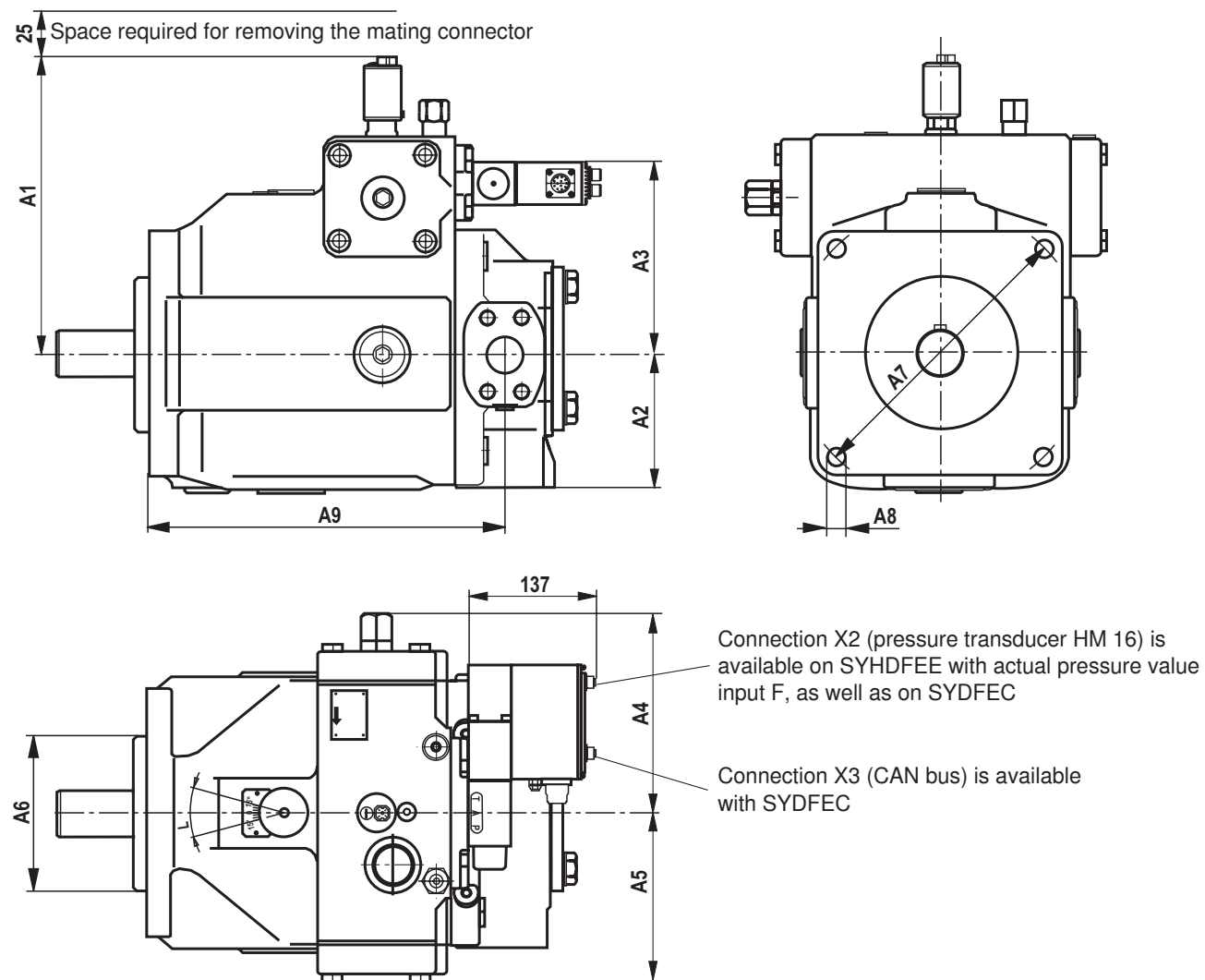
Pin	Signal input	Pin	Signal CAN
1	n.c.	3	CAN GND
2	IN, digital IN2 (DI2)	4	CAN-HIGH
		5	CAN-LOW

Top view
Connector



Unit dimensions: SYHDFE. (dimensions in mm)

The unit dimensions of the base pump (axial piston variable displacement pump A4VSO) are contained in data sheet 92050.



Size	A1	A2	A3	A4	A5	A6	A7	A8	A9
125	276	112.5	159	177	137	160	200	20	310
180	276	116	159	177	137	160	200	20	318
250	323	144	206	212	172	224	280	24	380
355	323	144	206	212	172	224	280	24	393

Shaft ends:

Size	Shaft Ø	= P ¹⁾	= Z ²⁾
125	50	AS 14x9x80	W 50x2x30x24x9g
180	50	AS 14x9x80	W 50x2x30x24x9g
250	60	AS 18x11x100	W 60x2x30x28x9g
355	70	AS 20x12x100	W 70x3x30x22x9g

¹⁾ Cylindrical with key DIN 6885

²⁾ Splined shaft profile DIN 5480

Through-drives: Torques

The control systems are supplied with universal through-drives U99.

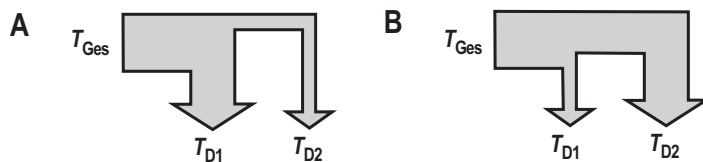
Their advantage is that the through-drive can be subsequently converted.

By simply exchanging the intermediate flange and the hub, the through-drive can be adjusted to the on-site requirements. The assemblies as exchange kits can be ordered separately, see "Accessories for through-drives" on page 18 as well as data sheet 95581.

Admissible drive and through-drive torques

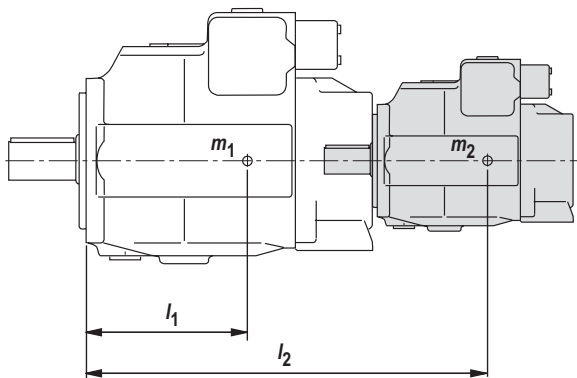
Size		125	180	250	355
Splined shaft					
Maximally admissible total drive torque at the shaft of pump 1 (Pump 1 + Pump 2)					
	$T_{Total\ max}$ [Nm]	1392	2004	2782	3952
A Admissible through-drive torque	$T_{D1\ max}$ [Nm]	696	1002	1391	1976
	$T_{D2\ max}$ [Nm]	696	1002	1391	1976
B Admissible through-drive torque	$T_{D1\ max}$ [Nm]	696	1002	1391	1976
	$T_{D2\ max}$ [Nm]	696	1002	1391	1976

Distribution of the torques



Admissible inertial torque

Related to connection flange of the main pump



m_1, m_2 [kg] Weight of the pump

l_1, l_2 [mm] Distance of the center of gravity

$$T_m = m_1 \cdot l_1 \cdot \frac{1}{102} + m_2 \cdot l_2 \cdot \frac{1}{102} \text{ [Nm]}$$

Size		125	180	250	355
Admissible inertial torque	$T_{m\ adm.}$ [Nm]	4200	4200	9300	9300
Admissible inertial torque with dynamic mass acceleration of 10 g = 98.1 m/sec ²	$T_{m\ adm.}$ [Nm]	420	420	930	930
Weight (SYHDFE or A4VSO...DR)	m [kg]	88	102	184	207
Distance of the center of gravity	l_1 [mm]	170	180	210	220

Unit dimensions: Through-drive U99 (dimensions in mm)

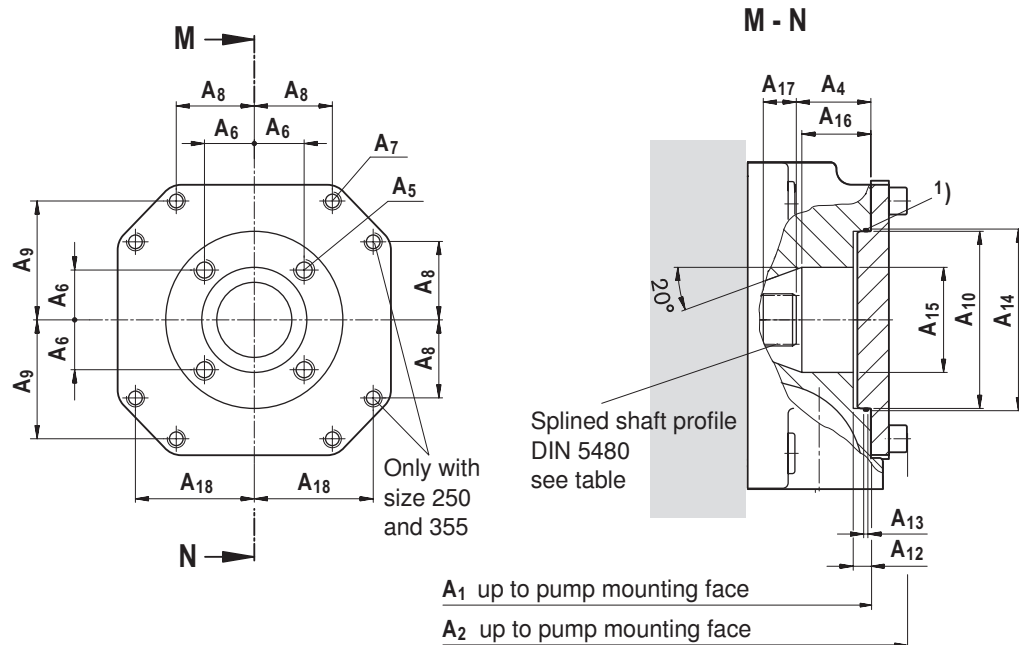
Before determining your construction, please request a binding installation drawing.

U99

Size 125 to 355

with through-drive shaft, without hub, without intermediate flange, closed by means of a pressure-tight cover in a fluid-tight way

Drawn without cover



Size Main pump	A ₁	A ₂	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₂	A ₁₃
125	347	368	49.7±1	M14; 15 deep	33.2 ^{+0.15}	M12; 18 deep	–	79.2 ^{+0.15}	ø118 ^{H7}	9	2.8 ^{+0.2}
180	371	392	49.7±1	M14; 15 deep	33.2 ^{+0.15}	M12; 18 deep	–	79.2 ^{+0.15}	ø118 ^{H7}	9	2.8 ^{+0.2}
250	431	455	61.4±1	M20; 22 deep	44.5 ^{+0.15}	M10; 15 deep	58.15 ^{+0.15}	86.2 ^{+0.15}	ø160 ^{H7}	9	2.8 ^{+0.2}
355	460	487	61.4±1	M20; 22 deep	44.5 ^{+0.15}	M10; 15 deep	58.15 ^{+0.15}	86.2 ^{+0.15}	ø160 ^{H7}	9	2.8 ^{+0.2}

Size Main pump	A ₁₄	A ₁₅	A ₁₆	A ₁₇	A ₁₈	Splined shaft profile DIN 5480	¹⁾ O-ring for subsequent attachment (is also supplied)
125	ø121 ^{+0.1}	ø70	46	22	–	W35x1.25x26x9g	118 x 2
180	ø121 ^{+0.1}	ø70	46	25	–	W35x1.25x26x9g	118 x 2
250	ø163 ^{+0.1}	ø87	64	30.5	86.2 ^{+0.15}	W42x1.25x32x9g	160 x 2
355	ø163 ^{+0.1}	ø87	64	34	86.2 ^{+0.15}	W42x1.25x32x9g	160 x 2

Accessories for through-drives

Mounting kits for axial piston variable displacement pumps and SYHDFE control systems

The order numbers for the combination of pumps are contained in the table shown below and in the data sheet 95581.

Components Universal through-drive	Main pump SYHDFE.-1X		Attachment pump					
	Size 125 Size 180	Size 250 Size 350	Size and type		Through-drive Centering Hub	Flange designation		
Mounting kit	R902447035	R902447037	Size 18	SYDFE.-2X	U52 82.55 mm 3/4 "	SAE J744 82-1 (A-B)		
Flange kit	R902446836	R902446850			Size 28	A10VSO / BR31	UB3 100 mm 7/8 "	ISO 3019-2 100B2HW
Hub	R902446823	R902446843					Size 45	Shaft S or R
Mounting kit	R902446996	R902446998	Size 71	SYDFE.-3X				
Flange kit	R902446808	R902446809			Size 100	A10VSO / BR32		
Hub	R902446824	R902446844					Size 140	Shaft S or R
Mounting kit	R902447001	R902447003	Size 125 Size 180	SYHDFE-1X				
Flange kit	R902446808	R902446809			Size 250	A4VSO / BR30		
Hub	R902446825	R902446845					Size 355	Shaft Z
Mounting kit	R902447014	R902447016						
Flange kit	R902446816	R902446817						
Hub	R902446826	R902443227						
Mounting kit	R902447021	R902447022						
Flange kit	R902446818	R902446820						
Hub	R910943555	R910921237						
Mounting kit	R902447025	R902447026						
Flange kit	R902446818	R902446820						
Hub	R910904588	R902446849						
Mounting kit	R902447019	R902447020						
Flange kit	R902446816	R902446817						
Hub	R902446848	R902446830						
Mounting kit		R902447028						
Flange kit		R902446822						
Hub		R910902972						
Mounting kit		R902447029						
Flange kit		R902446822						
Hub		R910941327						

Accessories for through-drives

Mounting kits for gear pumps

To the attachment pumps listed in the table, the following conditions apply:

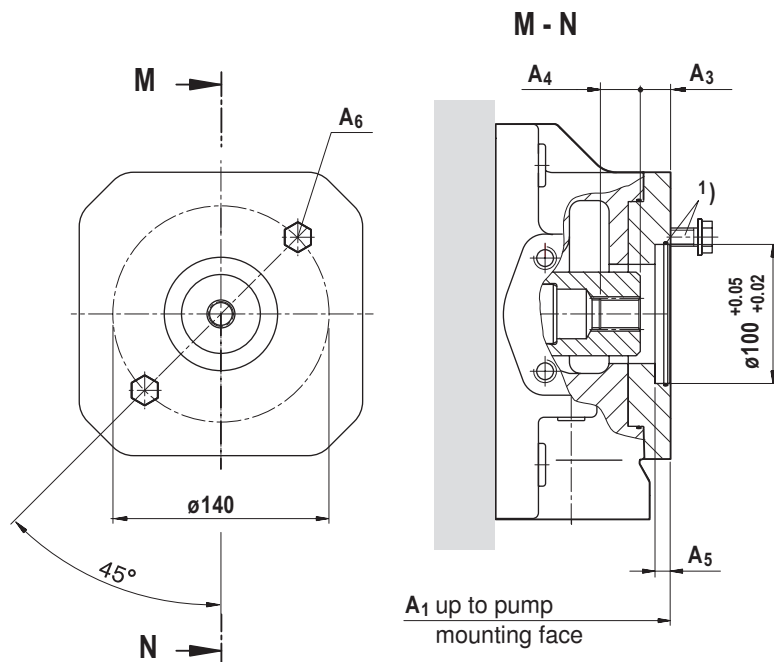
- PGH with shaft R, flange U2, see data sheet 10223
- PGF3 with shaft J, flange U2, see data sheet 10213
- AZPF with shaft R, front cover R, see data sheet 10089

Also observe that the flange and the through-drive (see ordering code page 2) are identical. Check in the current data sheet of the gear pump whether the shaft ends have the specified dimensions.

Components Universal through-drive	Main pump SYHDFE.-1X		Attachment pump		
	Size 125 Size 180	Size 250 Size 350	Size and type	Through-drive Centering Hub	Flange designation
Mounting kit	R902447030	R902447032	PGF2, PGH2, PGH3, AZPF	U01	SAE J744 82-2(A-B)
Flange kit	R902446836	R902446850		82.55	
Hub	R902446831			5/8 "	
Mounting kit	R902447040	R902447042	PGF 3	U 68	SAE J744 101-2(B)
Flange kit	R902446837	R902446851		101.6 mm	
Hub	R902446824	R902446844		7/8 "	
Mounting kit	R902447045	R902447047	PGH 4	U04	SAE J744 101-2(B)
Flange kit	R902446837	R902446851		101.6 mm	
Hub	R902446825	R902446845		1 "	
Mounting kit	R902447052	R902447053	PGH 5	U24	SAE J744 127-2(B)
Flange kit	R902446838	R902446852		127 mm	
Hub	R910943555	R910921237		1 ½ "	

Unit dimensions: Through-drives (dimensions in mm)

UB3 **Flange** ISO 3019-2 100, 2-hole
Hub for splined shaft, 22-4 SAE B, 7/8", 16/32 DP; 13T³⁾
 for attaching an A10VSO 28/31 splined shaft S (see data sheet 92711)

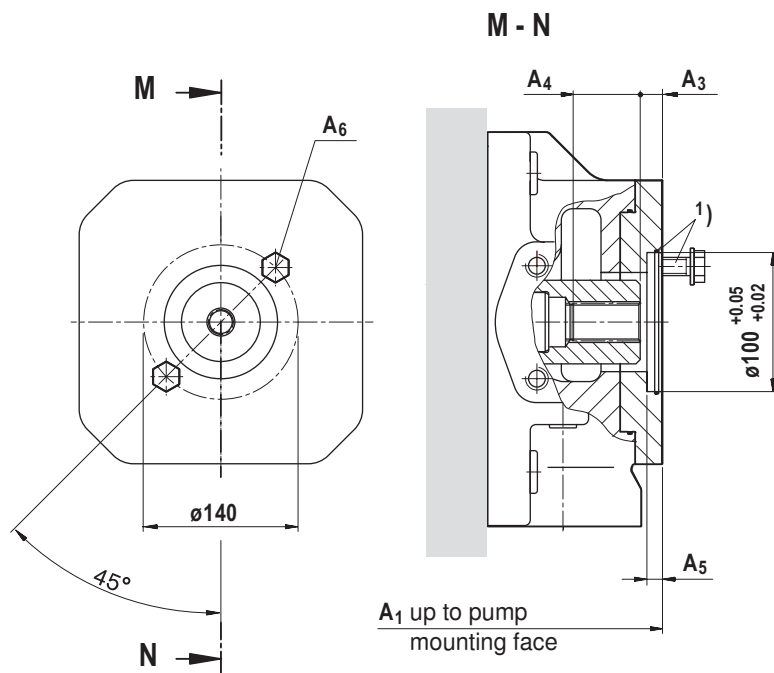


Size	A1	A3	A4	A5	A6 ²⁾
125	369	20.5	24.9	10	M12
180	393	20.5	24.9	10	M12
250	In preparation				
355	In preparation				

Before determining your construction, please request a binding installation drawing.

- ¹⁾ 2 mounting screws and O-ring seal are included in the scope of delivery
²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed
³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

UB4 **Flange** ISO 3019-2 100, 2-hole
Hub for splined shaft, 25-4 SAE B-B, 1", 16/32 DP; 15T³⁾
 for attaching an A10VSO 45/31 splined shaft S (see data sheet 92711)



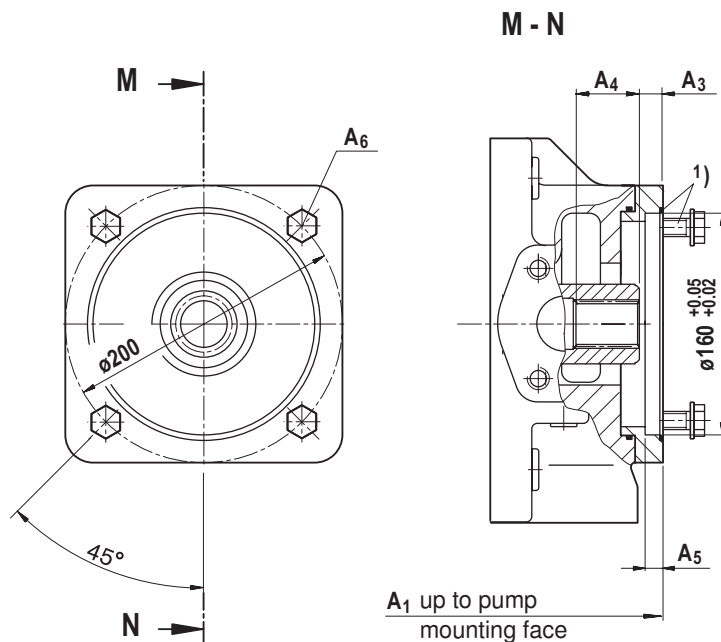
Size	A1	A3	A4	A5	A6 ²⁾
125	369	18.9	29.5	10	M12
180	393	18.9	29.5	10	M12
250	453	20.9	29.5	10	M12
355	482	20.9	29.5	10	M12

Before determining your construction, please request a binding installation drawing.

- ¹⁾ 2 mounting screws and O-ring seal are included in the scope of delivery
²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed
³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

Unit dimensions: Through-drives (dimensions in mm)

UB8 **Flange** ISO 3019-2 160, 4-hole
Hub for splined shaft, 32-4 SAE C, 1 1/4 ", 12/24 DP; 14T³⁾
 for attaching an A10VSO 71/32 splined shaft S (see data sheet 92714)

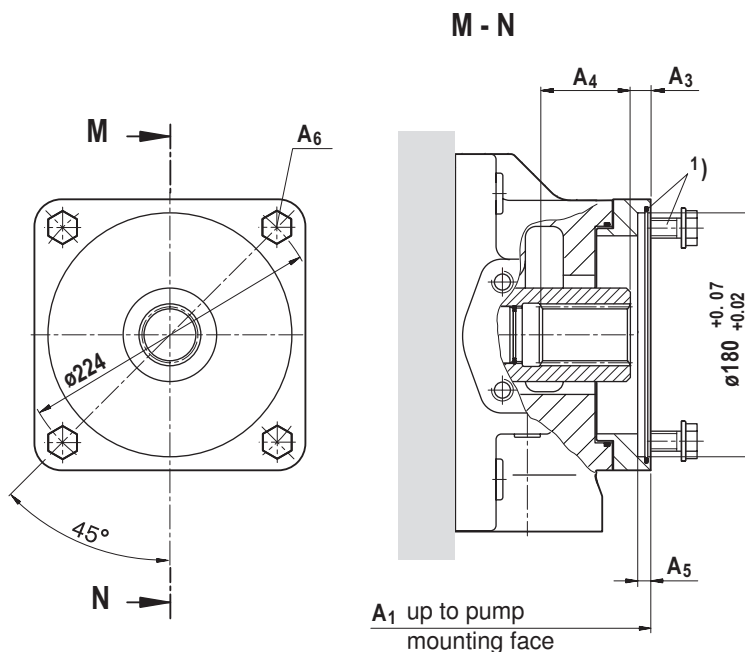


Size	A1	A3	A4	A5	A6 ²⁾
125	In preparation				
180	In preparation				
250	453	20.9	38	9	M16
355	In preparation				

Before determining your construction, please request a binding installation drawing.

- ¹⁾ Mounting screws and O-ring seal are included in the scope of delivery
²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed
³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

UB7 **Flange** ISO 3019-2 180, 4-hole
Hub for splined shaft, 44-4 SAE D, 1 3/4 ", 8/16 DP; 13T³⁾
 for attaching an A10VSO 140/31(32) splined shaft S (see data sheet 92711 (RE 92714))



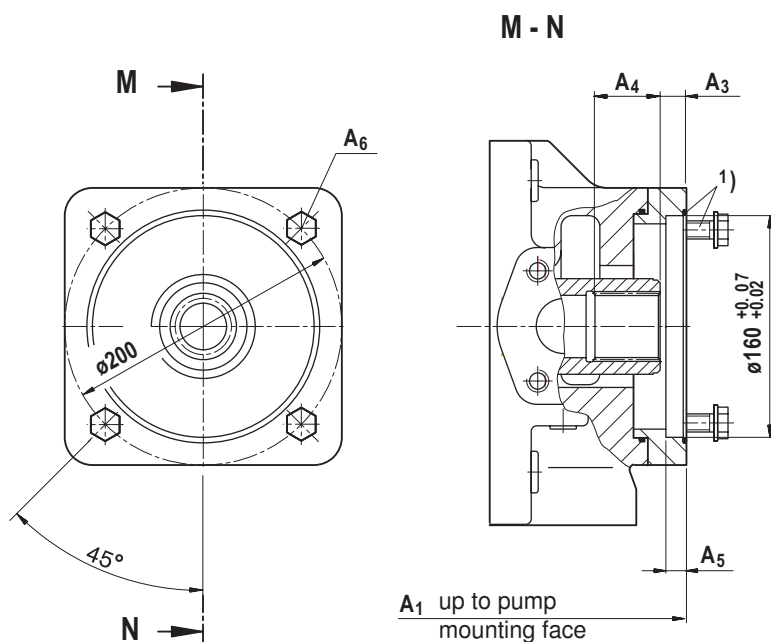
Size	A1	A3	A4	A5	A6 ²⁾
180	406	10.6	62	9	M16
250	453	10.6	64	9	M16
355	482	10.6	64	9	M16

Before determining your construction, please request a binding installation drawing.

- ¹⁾ Mounting screws and O-ring seal are included in the scope of delivery
²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed
³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

Unit dimensions: Through-drives (dimensions in mm)

U34 Flange ISO 3019-2 160, 4-hole
Hub according to DIN 5480 N50x2x24x8H
for attaching an A4VSO/G 125 or 180 splined shaft



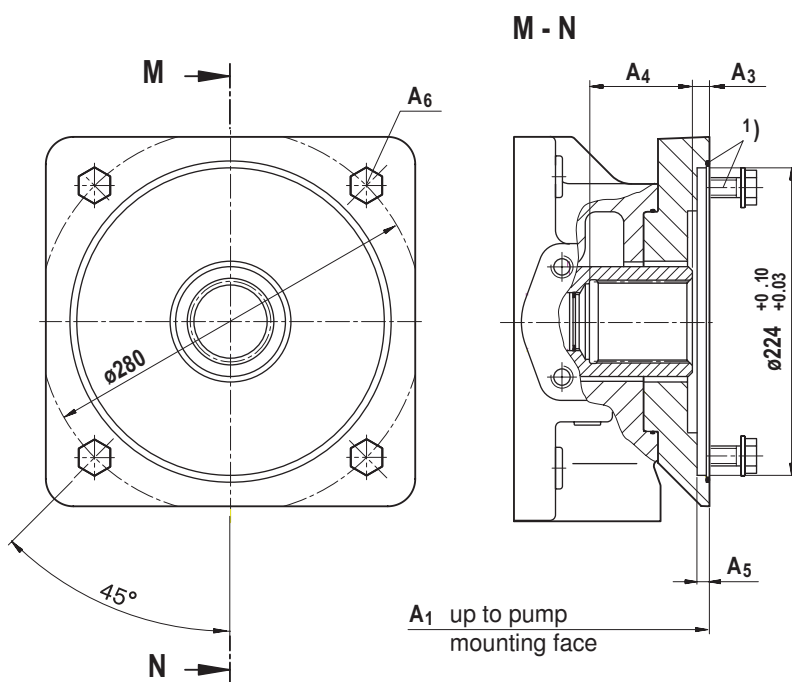
Size	A1	A3	A4	A5	A6 ²⁾
125	369	12.5	51.6	9	M16
180	393	12.5	51.6	9	M16
250	453	12.5	54	9	M16
355	482	12.5	54	9	M16

Before determining your construction, please request a binding installation drawing.

¹⁾ Mounting screws and O-ring seal are included in the scope of delivery

²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed

U35 Flange ISO 3019-2 224, 4-hole
Hub according to DIN 5480 N60x2x28x8H
for attaching an A4VSO/G or A4CSG 250 splined shaft



Size	A1	A3	A4	A5	A6 ²⁾
250	469	12.5	75	9	M20
355	498	12.5	75	9	M20

Before determining your construction, please request a binding installation drawing.

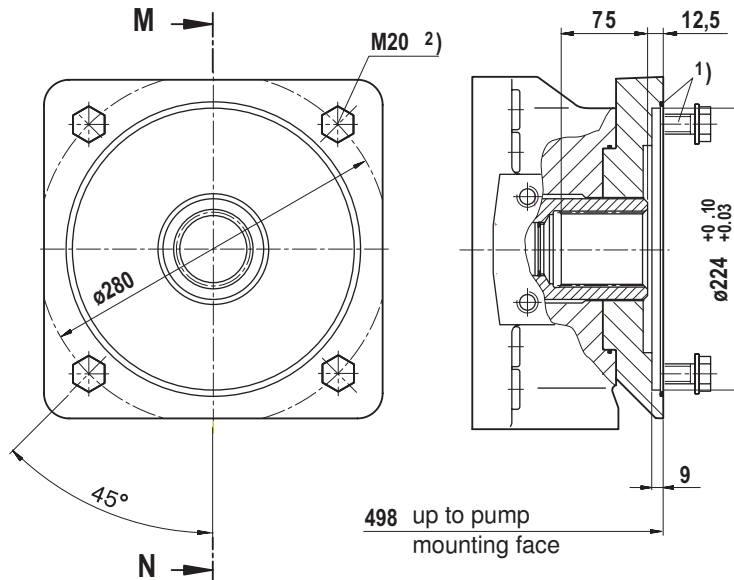
¹⁾ Mounting screws and O-ring seal are included in the scope of delivery

²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed

Unit dimensions: Through-drives (dimensions in mm)

U77 Flange ISO 3019-2 224, 4-hole
Hub according to DIN 5480 N70x3x22x8H
 for attaching an A4VSO/G or A4CSG 355 splined shaft

M - N



Size 355

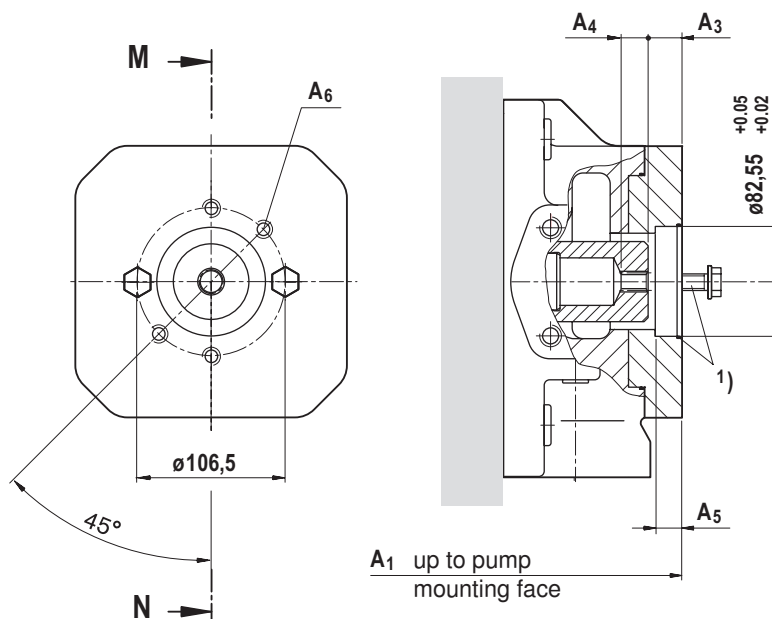
Before determining your construction, please request a binding installation drawing.

¹⁾ Mounting screws and O-ring seal are included in the scope of delivery

²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed

U01 Flange ISO 3019-1 82-2 (SAE A)
Hub for splined shaft, 16-4 SAE A, 5/8", 16/32 DP; 9T³⁾
 for attaching an external gear pump AZ-PF-1X-004 ... 022 (see data sheet 10089)
 Rexroth recommends a special version of the gear pumps, please contact us

M - N



Size	A1	A3	A4	A5	A6 ²⁾
125	369	16	19.4	13	M10
180	393	16	19.4	13	M10
250	453	16	19.4	13	M10
355	482	16	19.4	13	M10

Before determining your construction, please request a binding installation drawing.

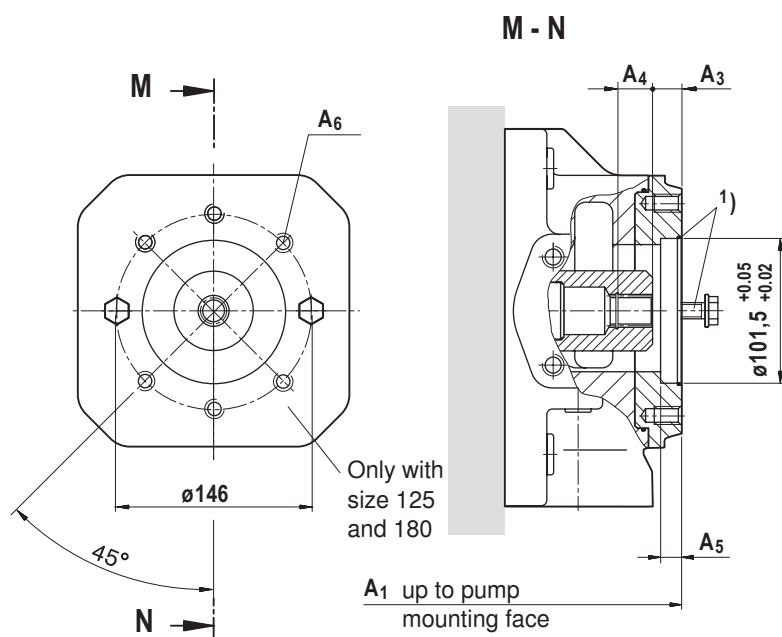
¹⁾ 2 mounting screws and O-ring seal are included in the scope of delivery

²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed

³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

Unit dimensions: Through-drives (dimensions in mm)

U68 **Flange** ISO 3019-1 101-2 (SAE B), **hub** for splined shaft 22-4 SAE B, 7/8", 16/32 DP; 13T³⁾ for attaching an external gear pump AZ-PN-1X020...032 (see data sheet 10091) or an A10VO 28/31 and 52(53) splined shaft S (see data sheet 92701 and 92703)
Rexroth recommends special versions of the gear pumps, please contact us



Size	A1	A3	A4	A5	A6 ²⁾
125	369	28	25	13	M12
180	393	28	25	13	M12
250	453	19.5	23.1	13	M12
355	482	19.5	23.1	13	M12

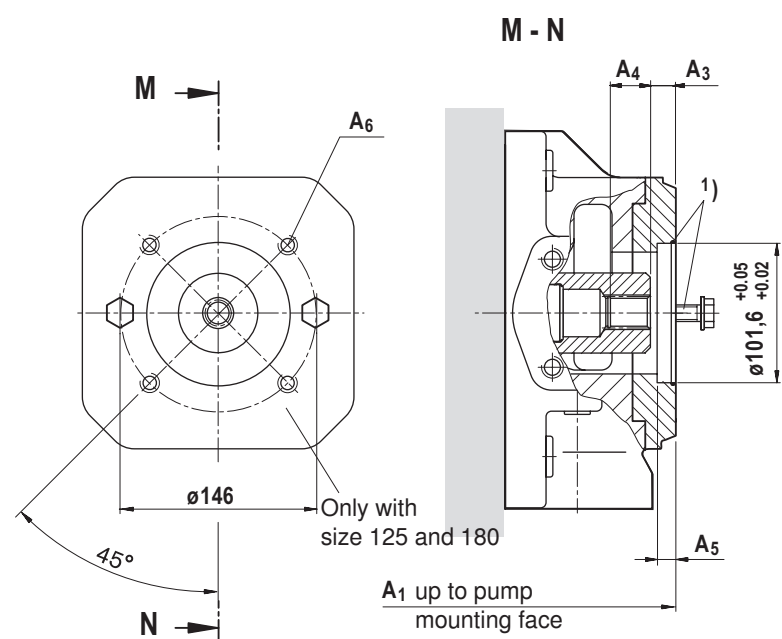
Before determining your construction, please request a binding installation drawing.

¹⁾ 2 mounting screws and O-ring seal are included in the scope of delivery

²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed

³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

U04 **Flange** ISO 3019-1 101-2 (SAE B), **hub** for splined shaft 25-4 SAE B-B, 1", 16/32 DP; 15T³⁾ for attaching an A10VO 45/31 and 52 (53) splined shaft S (see data sheet 92701 and 92703) or an internal gear pump PGH4 (see data sheet 10223)



Size	A1	A3	A4	A5	A6 ²⁾
125	369	18.9	29.4	13	M12
180	393	18.9	29.4	13	M12
250	453	18.9	29.4	13	M12
355	482	18.9	29.4	13	M12

Before determining your construction, please request a binding installation drawing.

¹⁾ 2 mounting screws and O-ring seal are included in the scope of delivery

²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed

³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

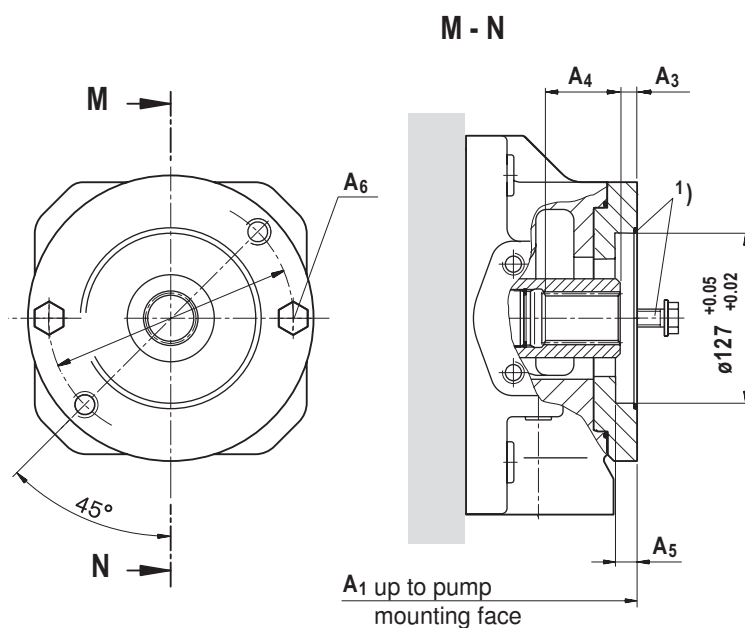
Unit dimensions: Through-drives (dimensions in mm)

U24

Flange ISO 3019-1 127-2 (SAE C)

Hub for splined shaft 38-4 SAE C-C, 1 1/2 ", 12/24 DP; 17T³⁾

for attaching an A10VSO 100/31 splined shaft S (see data sheet 92701) or an A10VO 85/52(53) splined shaft S (see data sheet 92703) or an internal gear pump PGH5 (see data sheet 10223)



Size	A1	A3	A4	A5	A6 ²⁾
125	369	10.4	50	13	M16
180	393	10.4	50	13	M16
250	453	12.4	55	13	M16
355	482	12.4	55	13	M16

Before determining your construction, please request a binding installation drawing.

¹⁾ 2 mounting screws and O-ring seal are included in the scope of delivery

²⁾ Thread according to DIN 13, for the max. tightening torques, the installation information on page 26 is to be observed

³⁾ According to ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

Hubs for standard electric motor coupling

Motor		SYHDFE.-1X		
Frame size/ characteristic	Shaft diameter	Size 125/180 Shaft 50 mm	Size 100 Shaft 60 mm	Size 140 Shaft 70 mm
225/0	60	R900026055		
250/0	65	R900026059		
280/0	75	R900026063	R900714636	
315/0	80	R901076760	R900088584 ¹⁾	R900210961 ¹⁾
315/1	80	R900026068	R900783295	R900210960

¹⁾ up to 40 °C

Project planning information

- Command values may only be switched via relays with gold contacts (low voltage, low currents).
- Always shield command and actual value lines.
- The distance to aerial lines or radios must be at least 1 m.
- Do not lay signal lines close to power cables.
- Supplementary notices on the SYHDFE control system can be found in the operating instructions (See section "More information about this control system" on this page).

Installation information

- Tightening torques:
 - The tightening torques specified in this data sheet are maximum values and must not be exceeded (maximum values for screw-in threads).
Manufacturer's specifications on the max. admissible tightening torques of the fittings used are to be observed!
 - For mounting screws according to DIN 13, we recommend checking the tightening torque case by case according to VDI 2230, version 2003.

More information about this control system

Operating instructions for SY(H)DFEE	30012-B
Operating instructions for SY(H)DFEC	30027-B
Data sheet for variable-speed control system Sytronix DFE n 5000	62242
Data sheet for universal through-drive for connecting two pumps into one combination	95581
Data sheet for axial piston variable displacement pump A4VSO	92050
Data sheet for axial piston variable displacement pump A4VSO for HFC	92053
Data sheet for pilot valve VT-DFP.-2X	29016
Data sheet for swivel angle sensor VT-SWA-LIN-1X	30263
Data sheet for pressure transducer HM 12-1X and HM 13-1X	29933
Data sheet for pressure transducer HM 16-1X	30266
Data sheet for pressure transducer HM 17-1X	30269
Operating instructions for test device VT-PDFE	29689-B
Current information is also available on the Internet at the address http://www.boschrexroth.com/sydfc (English) or http://www.boschrexroth.de/sydfc (German).	

Notes

Notes
