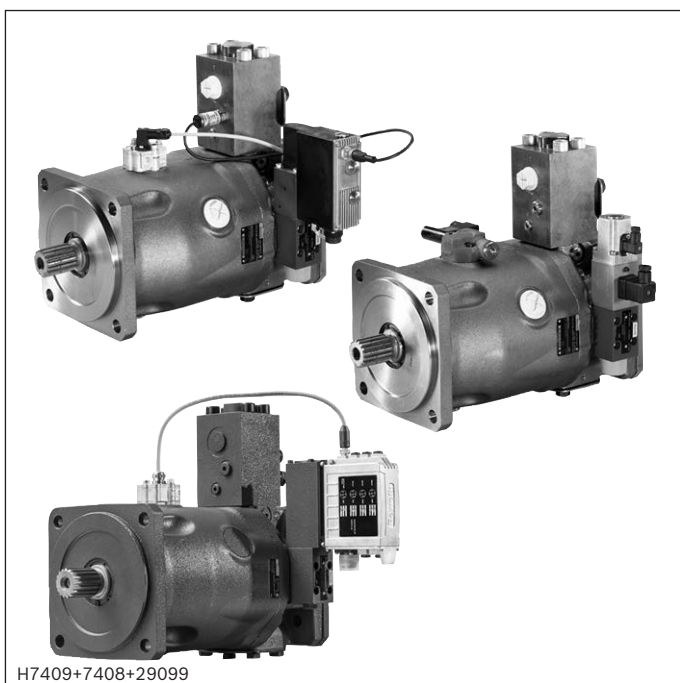


Pressure and flow control system

Type SYDFE1, SYDFEE, SYDFED, SYDFEF



H7409+7408+29099

- ▶ With axial piston variable displacement pump A10VSO.../32
- ▶ Size 45 ... 180
- ▶ Component series 3X
- ▶ Maximum operating pressure 280 bar
- ▶ Function: Swivel angle control, pressure control, torque limitation, speed control function, master-slave
- ▶ Communication: Sercos, PROFINET, EtherCAT, EtherNET/IP, POWERLINK, VARAN, CAN over EtherCAT, ServoDrive over EtherCAT, analog

Features

The control system is used for the electro-hydraulic control of swivel angle, pressure and power (partially optional) of an axial piston variable displacement pump.

It consists of the following components:

- ▶ Axial piston variable displacement pump A10VSO.../32
- ▶ Proportional directional valve type VT-DFP with inductive position transducer as pilot control valve. With the exception of type SYDFE1, the pilot control valve contains the electronics for controlling the system.
- ▶ Type SYDFE1: External control electronics VT 5041-3X for realizing all electric functions necessary (separate order)
- ▶ Position transducer for sensing the swivel angle
- ▶ Pressure transducer with suitable signal level and dynamics (optional)
- ▶ Preload valve with integrated pressure relief function SYDZ (optional)

Contents

| | |
|---|-----------|
| Features | 1 |
| Ordering code | 2 ... 7 |
| Installation orientation of the valve electronics | 6 |
| Section | 8, 9 |
| Schematic diagram | 10 ... 12 |
| Technical data | 13 ... 15 |
| Electrical connection | 16 ... 18 |
| LED indicators | 19, 20 |
| Control loop quality | 21 |
| Characteristic curves | 21 ... 23 |
| Dimensions | 24 ... 36 |
| Torsionally flexible couplings | 37 |
| Accessories for through-drives | 38 |
| Accessories | 39 |
| Project planning information | 40 |
| Further information | 40 |

Ordering code: Pump of the control system

01 02 03 04 05 06 07 08 09 See following pages

| | | | | | | | | | | | | | | |
|--|---|-----------|---|--|----------|---|----------|--|----------|--|--|---|--|-----|
| | - | 3X | / | | R | - | V | | B | | | - | | ... |
|--|---|-----------|---|--|----------|---|----------|--|----------|--|--|---|--|-----|

Series

| | | |
|----|---|----------------------------|
| 01 | Control system for external analog electronics (separate order) | SYDFE1 |
| | Control system with internal analog electronics | SYDFEE |
| | Control system with internal digital electronics (Ethernet-based bus systems) | SYDFED |
| | Control system with internal digital electronics (Ethernet-based bus systems) | SYDFEF |
| | Pump combinations (see order example page 7) | SY2DFE. SY3DFE. |

| | | |
|----|--|-----------|
| 02 | Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimensions) | 3X |
|----|--|-----------|

Size

| | | | | |
|------------|------------|------------|------------|------------|
| 045 | 071 | 100 | 140 | 180 |
|------------|------------|------------|------------|------------|

| | | | | | | | |
|----|---------------------------------|-----|-----|-----|-----|-----|-----------------|
| 03 | Displacement in cm ³ | 045 | 071 | 100 | 140 | 180 | e.g. 071 |
|----|---------------------------------|-----|-----|-----|-----|-----|-----------------|

Direction of rotation looking at the drive shaft

| | | | | | | | |
|----|-----------|---|---|---|---|---|----------|
| 04 | Clockwise | ✓ | ✓ | ✓ | ✓ | ✓ | R |
|----|-----------|---|---|---|---|---|----------|

Hydraulic fluid

| | | | | | | | |
|----|--|---|---|---|---|---|----------|
| 05 | Mineral oil according to DIN 51524 (HLP) | ✓ | ✓ | ✓ | ✓ | ✓ | V |
|----|--|---|---|---|---|---|----------|

Drive shaft variant

| | | | | | | | |
|----|---|----|--------|--------|--------|--------|----------|
| 06 | Splined shaft profile SAE J 744 ¹⁾ | - | - | 1 1/2" | 1 3/4" | 1 3/4" | S |
| | Splined shaft profile SAE J 744 (higher through-drive torque) | 1" | 1 1/4" | - | - | - | R |

Connection flange according to ISO 3019-2 (4-hole)

| | | | | | | | |
|----|-------------------|-----|-----|-----|-----|-----|----------|
| 07 | Ø centering in mm | 125 | 160 | 180 | 180 | 180 | B |
|----|-------------------|-----|-----|-----|-----|-----|----------|

Subplate design and transmission design

| | | | | | | | |
|----|--|-----------------|---|-----------------|---|---|---------------|
| 08 | Without shock and vibration absorption (standard speed) | - ²⁾ | ✓ | ✓ | ✓ | - | 22U00- |
| | Without shock and vibration absorption (high speed) | ✓ | ✓ | ✓ | ✓ | - | 22U00S |
| | With shock and vibration absorption (standard speed) | ✓ | ✓ | ✓ | ✓ | ✓ | 32U00- |
| | With shock and vibration absorption (high speed) | ✓ | ✓ | - ²⁾ | ✓ | - | 32U00S |

Base pump variant

| | | | | | | | |
|----|---|---|---|---|-----------------|---|-------------|
| 09 | Standard (internal pilot oil) | ✓ | ✓ | ✓ | ✓ | ✓ | 0000 |
| | External supply | ✓ | ✓ | ✓ | ✓ ³⁾ | ✓ | 0479 |
| | Regenerative operation with external supply (only version "22U00-") | - | ✓ | ✓ | ✓ | - | 0487 |
| | Regenerative operation without external supply (only version "22U00-") | - | ✓ | ✓ | - | - | 0541 |

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

2) On request

3) Not for version "22U00-"

Ordering code: Type SYDFE1 - pilot control and preload valve

| | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
| | - | 3X | / | | R | - | V | | B | | | - | * |

Control spool version

| | | |
|----|--|----------|
| 10 | Standard | A |
| | 2 grooves (only for replacement requirement) | B |
| | 4 grooves | C |

Installation orientation, solenoid

| | | |
|----|--|-------------|
| 11 | Mating connector is orientated radially to the pump axis | 0 |
| 12 | Features currently not used | XOXX |

Preload valve with integrated pressure limitation

| | | |
|----|---|----------|
| 13 | Pressure limitation 200 bar (tolerance ± 8 bar) ⁴⁾ | 1 |
| | Pressure limitation 250 bar (tolerance ± 10 bar) ⁴⁾ | 2 |
| | Pressure limitation 300 bar (tolerance ± 12 bar) ^{4; 5)} | 3 |
| | Without preload valve | X |
| 14 | Further details in the plain text | * |

⁴⁾ The pressure limiting function of the preload valve is designed for a maximum speed of 1800 rpm for NG140 and for a maximum speed of 1500 rpm for NG180. Higher speeds are available on request.

The pressure limiting function is not suitable for continuous operation.

⁵⁾ Observe nominal pressure of pump system.

Ordering code: Type SYDFEE - pilot control and preload valve

| | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| | - | 3X | / | | R | - | V | | B | | | | | | | - | * |

Control spool version

| | | |
|----|-----------|----------|
| 10 | Standard | A |
| | 4 grooves | C |

Installation orientation of the integrated electronics (see page 6 and "Dimensions")

| | | |
|----|---|----------|
| 11 | Radially to the pump axis | 0 |
| | Folded 90° in the direction of the subplate | 2 |

Additional functions: Closed-loop control

| | | |
|----|--|----------|
| 12 | Switchable 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 |

Electronics assembly

| | | |
|----|--|----------|
| 13 | Standard electronics with leakage compensation | 0 |
| | Standard electronics without leakage compensation | 1 |

Actual pressure value input (see "Electrical connections")

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

Pressure transducer

| | | |
|----|--|----------|
| 15 | HM 20-2X/315-F-C13-0.5, measurement range 315 bar (0.5 ... 5 V) with connection cable 0.5 m for direct connection to X2 (only version "F") | L |
| | Without pressure transducer | X |

Preload valve with integrated pressure limitation

| | | |
|----|---|----------|
| 16 | Pressure limitation 200 bar (tolerance ± 8 bar) ⁴⁾ | 1 |
| | Pressure limitation 250 bar (tolerance ± 10 bar) ⁴⁾ | 2 |
| | Pressure limitation 300 bar (tolerance ± 12 bar) ^{4; 5)} | 3 |
| | Without preload valve | X |

| | | |
|----|-----------------------------------|----------|
| 17 | Further details in the plain text | * |
|----|-----------------------------------|----------|

⁴⁾ The pressure limiting function of the preload valve is designed for a maximum speed of 1800 rpm for NG140 and for a maximum speed of 1500 rpm for NG180. Higher speeds are available on request.

The pressure limiting function is not suitable for continuous operation.

⁵⁾ Observe nominal pressure of pump system.

Ordering code: Type SYDFED - pilot control and preload valve

| | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | |
| | - | 3X | / | | R | - | V | | B | | | | | | | | - | * |

Control spool version

| | | |
|----|----------|----------|
| 10 | Standard | A |
|----|----------|----------|

Installation orientation of the integrated electronics (see page 6 and "Dimensions")

| | | |
|----|---|----------|
| 11 | Radially to the pump axis | 0 |
| | Folded 90° in the direction of the subplate | 2 |

Additional functions: Closed-loop control

| | | |
|----|------------------------------|----------|
| 12 | Standard | A |
| | For variable-speed operation | N |

Field bus interface

| | | |
|----|-------------------------------|------------------------|
| 13 | Sercos III | S |
| | EtherCAT (CANopen profile) | T |
| | EtherCAT (Servodrive profile) | D |
| | VARAN (Servo drive profile) | V |
| | Ethernet/IP | E |
| | PROFINET RT | N |
| | Powerlink | W ²⁾ |

Actual pressure value input (freely configurable); **parameter setting on delivery** (see "Electrical connections")

| | | | |
|----|---------------------------|-----------|----------|
| 14 | Voltage input 0 ... 10 V | Port XH4 | V |
| | Voltage input 0.5 ... 5 V | Port X2M1 | F |

Pressure transducer

| | | |
|----|--|----------|
| 15 | HM 20-2X/315-F-C13-0.5, measurement range 315 bar (0.5 ... 5 V) with connection cable 0.5 m for direct connection to X2M1 (only version "F") | L |
| | Without pressure transducer | X |

Preload valve with integrated pressure limitation

| | | |
|----|--|----------|
| 16 | Pressure limitation 200 bar (tolerance ± 8 bar) ⁴⁾ | 1 |
| | Pressure limitation 250 bar (tolerance ± 10 bar) ⁴⁾ | 2 |
| | Pressure limitation 300 bar (tolerance ± 12 bar) ^{4); 5)} | 3 |
| | Without preload valve | X |

| | | |
|----|-----------------------------------|----------|
| 17 | Further details in the plain text | * |
|----|-----------------------------------|----------|

2) On request

4) The pressure limiting function of the preload valve is designed for a maximum speed of 1800 rpm for NG140 and for a maximum speed of 1500 rpm for NG180. Higher speeds are available on request.

The pressure limiting function is not suitable for continuous operation.

5) Observe nominal pressure of pump system.

Ordering code: Order examples

Order example for single pump: SYDFEE-3X/100R-VSB32U00-0479-A0A0XX

Order example for pump combinations (material numbers or type designations must be combined with "+")

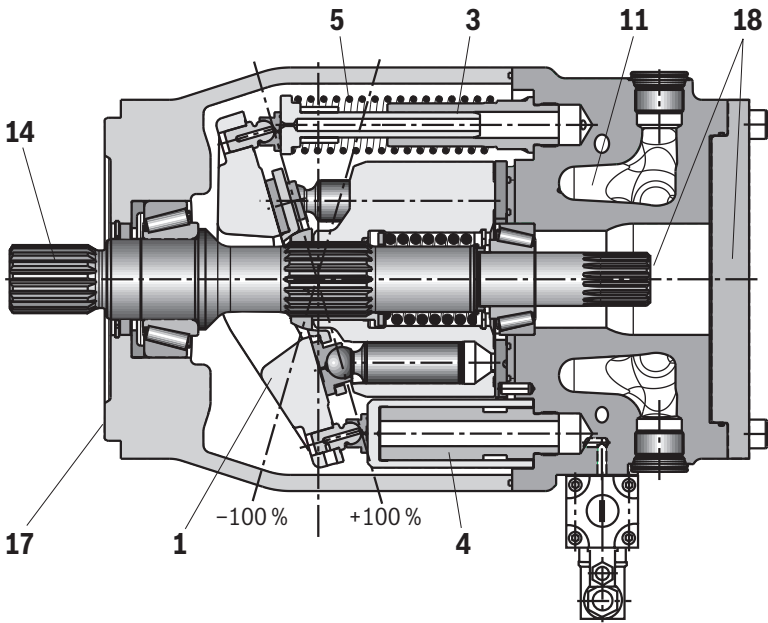
► Double pump

| | | | |
|--|--|---|--------------------------------------|
| | Main pump (1st pump) | | + Attachment pump (2nd pump) |
| | SY2DFEE-3X/100-071/01177440 | | + 01177441 |
| | SY2DFEE-3X/100-071/ SYDFEE-3X/100R-VSB32U00-0000-A0A1VX3 | + | SYDFEE-3X/071R-VRB32U00-0000-A0A1VX3 |
| Double pump Size of the main pump Size of the attachment pump or pump abbreviation if the attachment pump is not SYDFE (e.g., PGF) Material number without "R9" for the main pump or type designation if material number not known Pump combination, mounted with accessories Material number without "R9" for the attachment pump or type designation if material number not known | | | |

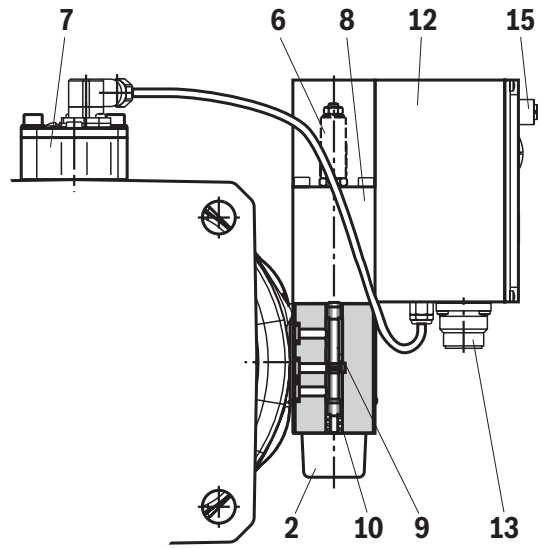
► Triple pump

| | | |
|----------------------|------------------------------|------------------------------|
| Main pump (1st pump) | + Attachment pump (2nd pump) | + Attachment pump (3rd pump) |
| SY3DFEE-3X/01128835 | + 01151805 | + 01128836 |

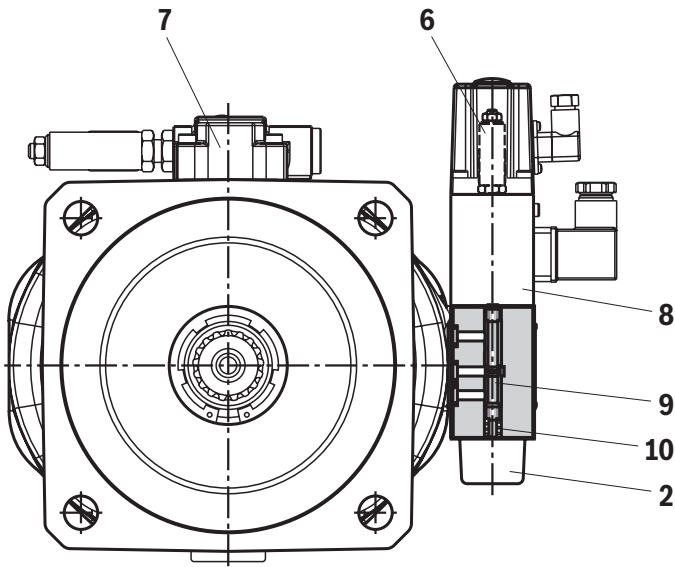
Section: Type SYDFE1, SYDFEE, SYDFED



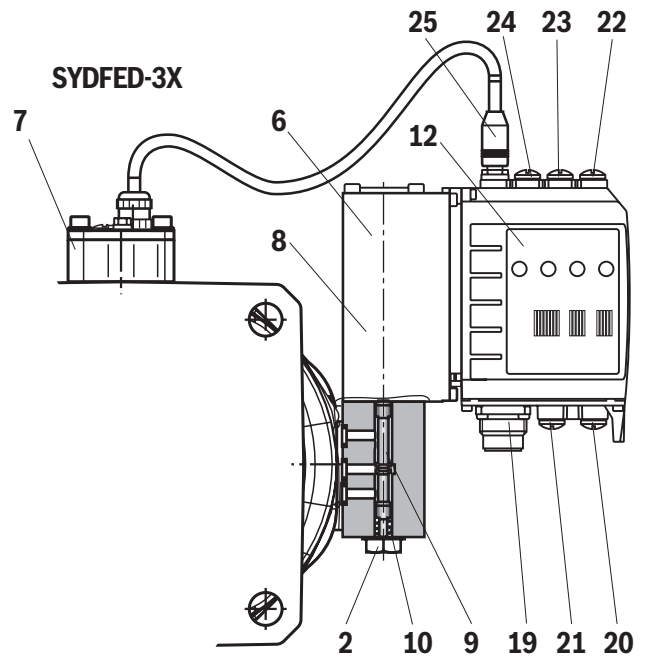
SYDFEE-3X



SYDFE1-3X

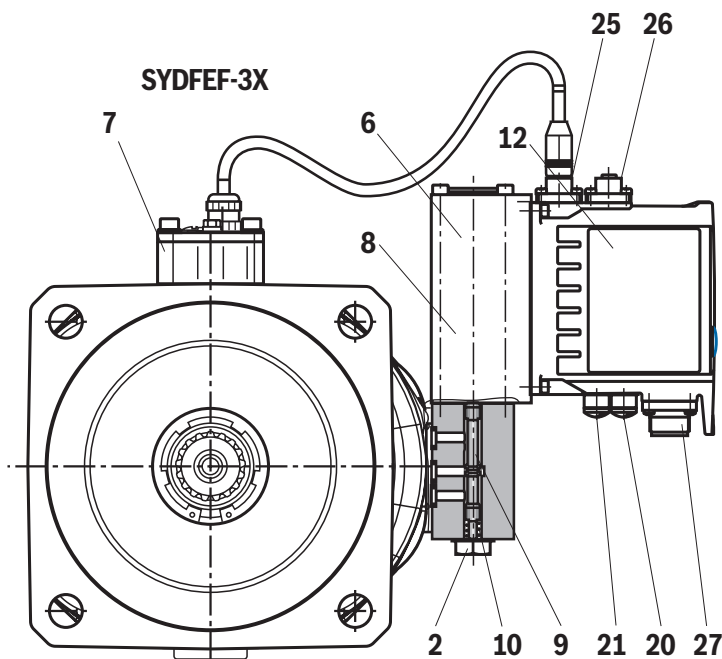
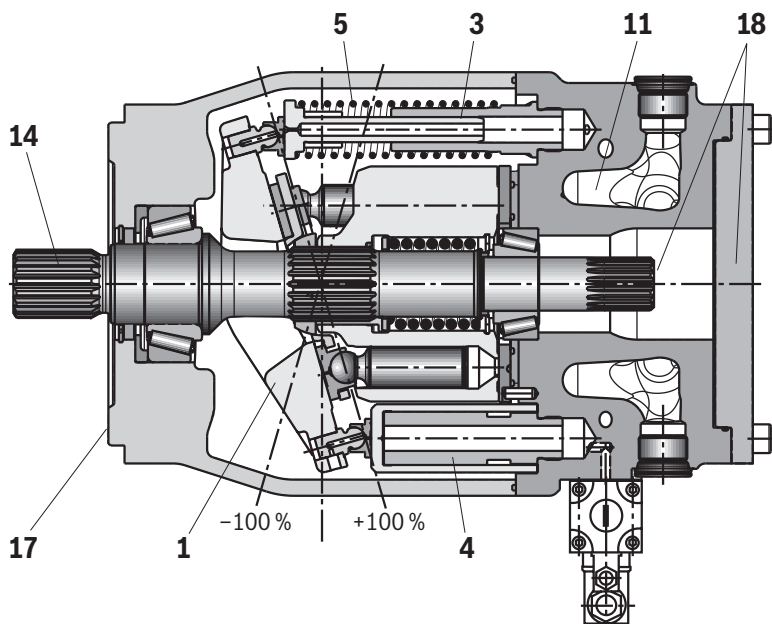


SYDFED-3X



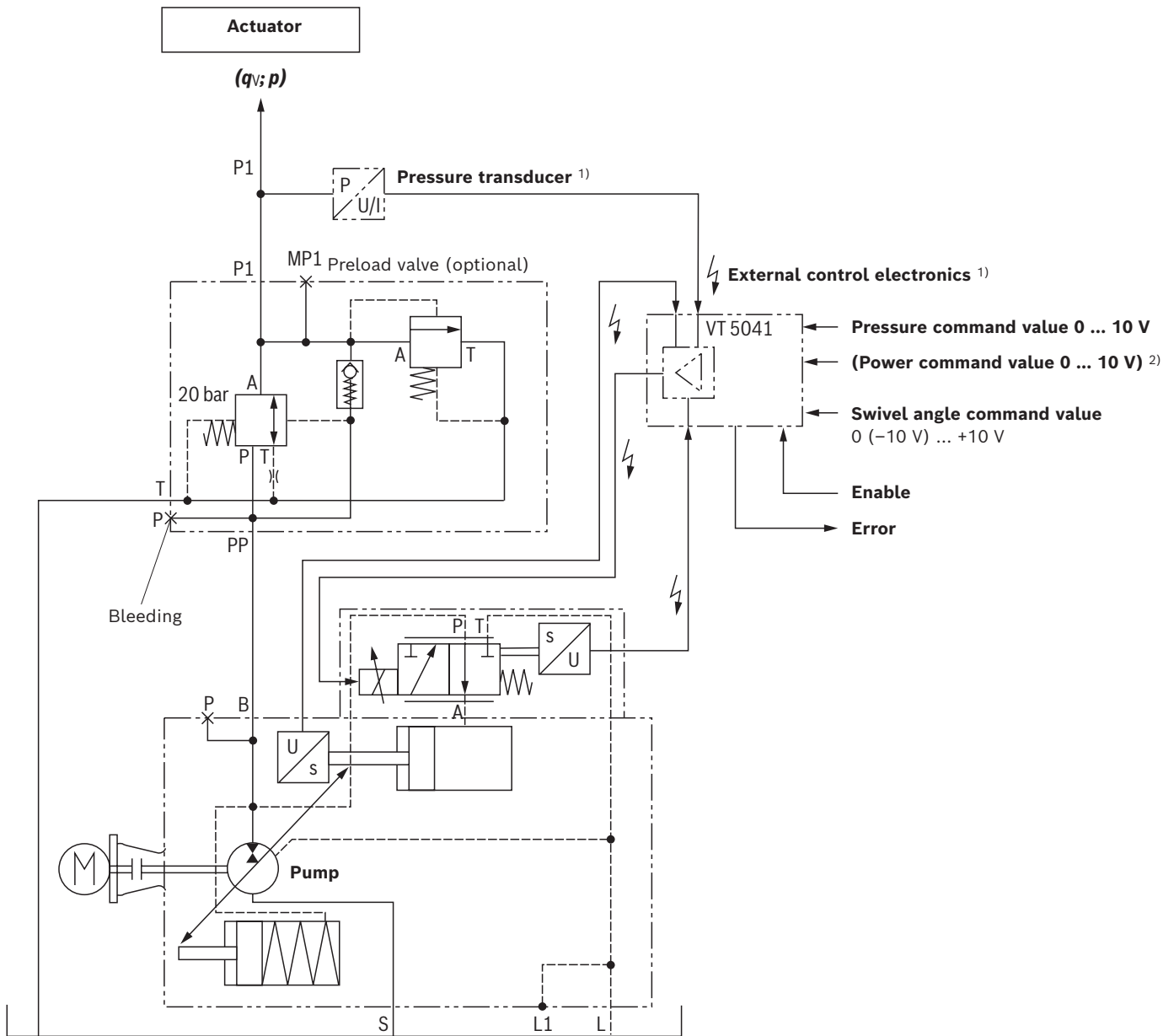
- 1 Swash plate
- 2 Pilot control valve
- 3 Counter piston
- 4 Actuating piston
- 5 Spring
- 6 Inductive position transducer for valve position
- 7 Swivel angle position sensor
- 8 Proportional solenoid
- 9 Valve spool
- 10 Spring
- 11 Pre-compression volume PCV
- 12 Integrated electronics
- 13 Connector X1
- 14 Drive shaft

- 15 Connector X2 for connecting the pressure transducer HM 20, cable version (for SYDFEE only with actual pressure value input "F")
- 17 Connection flange
- 18 Through-drive "U.." closed with cover
- 19 Connector XH4
- 20 Multi Ethernet interface X7E1
- 21 Multi Ethernet interface X7E2
- 22 Configurable sensor interface X2M1
- 23 Configurable sensor interface X2M2
- 24 Reserved, X2N
- 25 Actual swivel angle value input X8A

Section: Type SYDFEF

- | | |
|--|---|
| 1 Swash plate | 14 Drive shaft |
| 2 Pilot control valve | 17 Connection flange |
| 3 Counter piston | 18 Through-drive "U." closed with cover |
| 4 Actuating piston | 20 Multi Ethernet interface X7E1 |
| 5 Spring | 21 Multi Ethernet interface X7E2 |
| 6 Inductive position transducer for valve position | 25 Actual swivel angle value input X8A1 |
| 7 Swivel angle position sensor | 26 Configurable sensor interface X2N |
| 8 Proportional solenoid | 27 Connector XH1 |
| 9 Valve spool | |
| 10 Spring | |
| 11 Pre-compression volume PCV | |
| 12 Integrated electronics | |

Schematic diagram: Type SYDFE1 - actuating system supplied internally



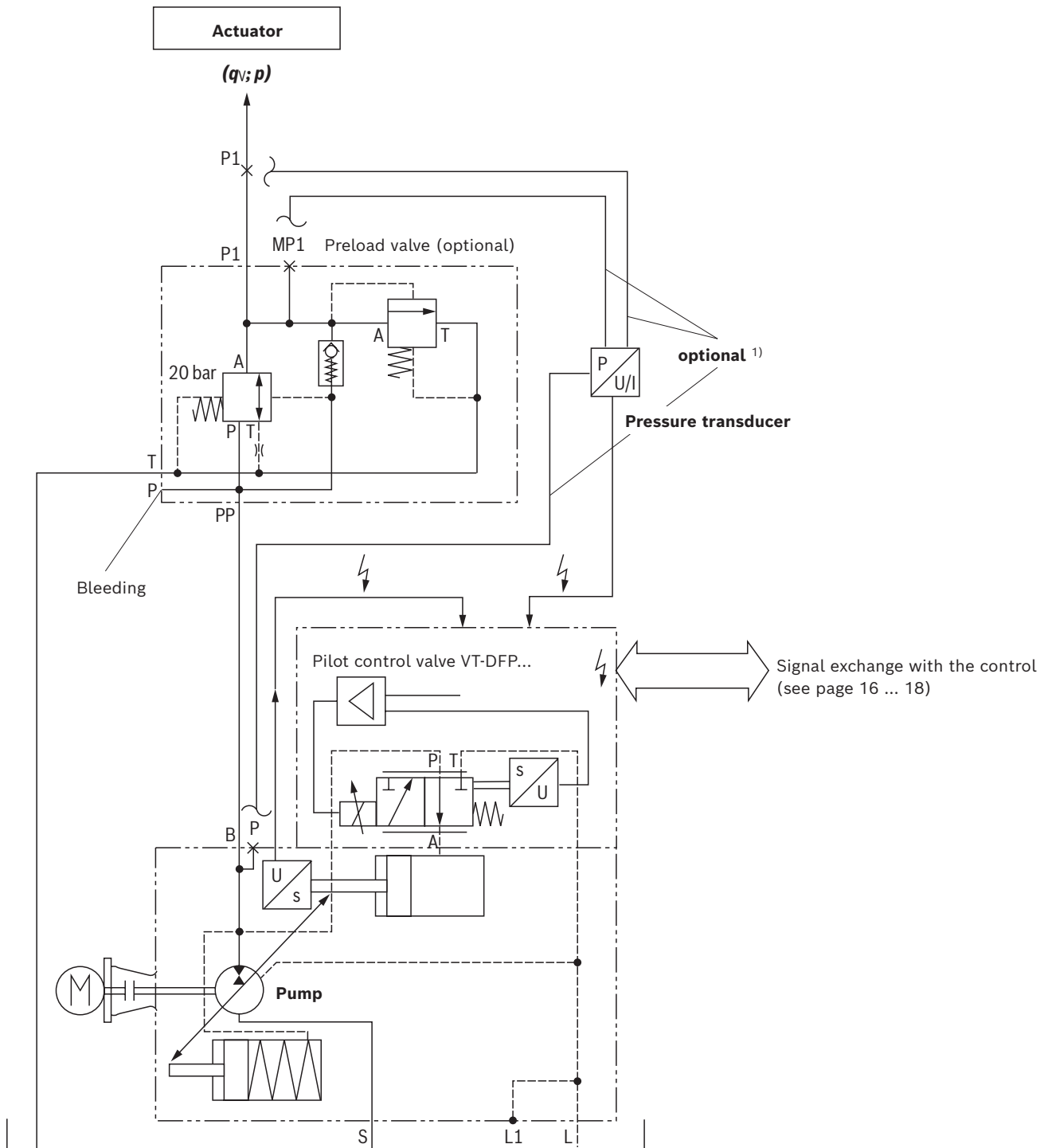
¹⁾ Separate order

²⁾ Optional

Notice:
 The actual pressure value at pressure port B must not be less than 10 bar for more than 10 minutes (lubrication).

For details regarding the electrical circuitry, see data sheet 30242

Schematic diagram: Type SYDFEE, SYDFED, SYDFEF – actuating system supplied internally



- 1) ▶ When using the HM 20 pressure transducer, cable version:
 Installation in P (pump) or MP1 (preload valve) in connection with actual pressure value input "F"
 ▶ When using an external pressure transducer:
 Installation in line P1 (preferably near the actuator) and electrical connection via the central plug.
 ▶ When using a preload valve: Connection of the pressure transducer to P1 or MP1.

Notice:
 The actual pressure value at pressure port B must not be less than 10 bar for more than 10 minutes (lubrication).

Technical data

(For applications outside these values, please consult us!)

| Mechanical and hydraulic | | | | | | | |
|--|--|--|--|--------------------|--------------------|--------------------|--------------------|
| Size | NG | 45 | 71 | 100 | 140 | 180 | |
| Displacement | cm ³ | 45 | 71 | 100 | 140 | 180 | |
| Maximum speed | ▶ Standard | rpm | 1800 ¹⁾ | 1800 ¹⁾ | 1800 ¹⁾ | 1800 ²⁾ | 1800 ²⁾ |
| | ▶ High-speed (version "22U..S") | rpm | 3000 ²⁾ | 2550 ²⁾ | 2300 ²⁾ | 2050 ²⁾ | – |
| | ▶ High-speed (version "32U..S") | rpm | 3000 ²⁾ | 2550 ²⁾ | – | 2200 ²⁾ | – |
| Minimum speed | rpm | 250 | | | | | |
| Maximum flow at ... | ▶ Maximum speed (standard) | l/min | 81 | 128 | 180 | 252 | 324 |
| | ▶ Maximum speed (high speed (version "22U..S")) | l/min | 135 | 181 | 230 | 287 | – |
| | ▶ Maximum speed (high speed (version "32U..S")) | l/min | 135 | 181 | – | 308 | – |
| | ▶ $n_E = 1500$ rpm | l/min | 67.5 | 106.7 | 150 | 210 | 270 |
| Maximum power ($\Delta p = 280$ bar) at ... | ▶ Maximum speed (standard) | kW | 38 | 59.7 | 84 | 118 | 151 |
| | ▶ Maximum speed (high speed (version "22U..S")) | kW | 62.8 | 85 | 107 | 134 | – |
| | ▶ Maximum speed (high speed (version "32U..S")) | kW | 62.8 | 85 | – | 144 | – |
| | ▶ $n_E = 1500$ rpm | kW | 31 | 50 | 70 | 98 | 125 |
| Maximum torque ($\Delta p = 280$ bar, $n_{0\ max}$) | Nm | 200 | 317 | 446 | 624 | 802 | |
| Maximum drive torque | ▶ Splined shaft "S" overall torque | Nm | | | 1104 | 1620 | 1620 |
| | ▶ Maximum through-drive torque | Nm | | | 778 | 1266 | 1266 |
| | ▶ Splined shaft "R" overall torque | Nm | 400 | 644 | | | |
| | ▶ Maximum through-drive torque | Nm | 365 | 548 | | | |
| Drive shaft load (see below) | ▶ Maximum axial force | N | 1500 | 2400 | 4000 | 4800 | 800 |
| | ▶ Maximum radial force ³⁾ | N | 1500 | 1900 | 2300 | 2800 | 2300 |
| Mass | ▶ Pump without through-drive (incl. pilot control valve) | kg | 32 | 49 | 71 | 75 | 80 |
| | ▶ Additional preload valve | kg | 3,3 | 6.3 | 6.3 | 6.3 | 6.3 |
| | ▶ In addition, in case of external supply | kg | 2 | 2 | 2 | 2 | 2 |
| Moment of inertia around drive axis | kgm ² | 0.0035 | 0.0087 | 0.0185 | 0.0276 | 0.033 | |
| Filling quantity of the housing | l | 1.0 | 1.6 | 2.2 | 3,0 | 2.7 | |
| Nominal pressure | bar | 280 | | | | | |
| Maximum operating pressure | bar | 350 ⁴⁾ | | | | | |
| Minimum operating pressure | ▶ With preload valve | bar | ≥1 | | | | |
| | ▶ Without preload valve | bar | ≥20 | | | | |
| | ▶ External supply (20 bar) | bar | >10 in continuous operation; for operation below 10 bar see page 11. | | | | |
| Admissible inlet pressure at suction port S | ▶ Standard | bar | 0.8 ... 10 | | | | |
| | ▶ High-speed | | 1.0 ... 10 | | | | |
| Hydraulic fluid | | Mineral oil (HLP) according to DIN 51524 ⁵⁾ | | | | | |
| Hydraulic fluid temperature range | °C | –20 ... +70 ⁵⁾ | | | | | |
| Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c) | | Class 18/16/13 (for particle size ≤ 4/6/14 μm) | | | | | |

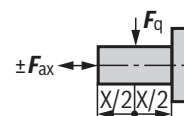
1) The values are applicable at an absolute pressure of 0.8 bar in suction port S.

2) The values are applicable at an absolute pressure of 1.0 bar in suction port S.

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

4) See also data sheet 92714.

5) For version "32U..S" 30 ... 60 °C. Mineral oil HLP/HLPD 32/46 according to DIN 51524 must be used.



Technical data

(For applications outside these values, please consult us!)

| Electrical | | | | |
|---|--|---------|---|---------------------|
| Type | | | SYDFEE | |
| Operating voltage | | VDC | 24 ^{+40%} _{-5%} | |
| Operating range (short-time operation) | ▶ Upper limit value | V | 35 | |
| | ▶ Lower limit value | V | 21 | |
| Current consumption (in static control operation) | ▶ Rated current | A | 0.6 | |
| | ▶ Maximum current | A | 1.25 | |
| Inputs | ▶ Actual pressure value input X1; pin 10 and 11 | | Determined by means of ordering code | |
| | ▶ Analog, current, load ⁶⁾ | Ω | 100 | |
| | ▶ Analog, voltage | kΩ | ≥50 | |
| | ▶ Digital | Logic 0 | V | ≤ 0.6 |
| | | Logic 1 | V | ≥21 |
| Outputs | ▶ p_{actual} | V | 0 ... 10 | |
| | | mA | 1.5 | |
| | ▶ q_{actual} | V | ±10 | |
| | | mA | 1.5 | |
| | ▶ Digital | Logic 0 | V | $U_a < 1 \text{ V}$ |
| | Logic 1 | V | $U_a \geq U_B - 5 \text{ V}; 10 \text{ mA}$ (short-circuit-proof) | |
| Ambient temperature range at the pump | | °C | 0 ... 60 | |
| Storage temperature range (pump + electronics) | | °C | 0 ... 70 | |
| Electronics design | | | Integrated at pilot control valve (OBE) | |
| Protection class according to EN 60529 | ▶ Pump incl. pilot control valve | | IP65 (with correctly installed electrical connection) | |

⁶⁾ Maximum admissible input current 30 mA for configuration on current input.

**Notice:**

Electrical data type SYDFE1 see data sheet 30242.

Technical data

(For applications outside these values, please consult us!)

| Electrical | | | |
|--|----------------------------------|---|---------------------------|
| Type | | SYDFED | SYDFEF |
| Supply voltage ⁸⁾ | ▶ Nominal value | VDC | 24 |
| | ▶ Minimum | VDC | 18 |
| | ▶ Maximum | VDC | 36 |
| | ▶ Maximum residual ripple | Vpp | 2.5 |
| Maximum power consumption | | W | 40 |
| Fuse protection, external | | A | 4, time-lag |
| AD/DA resolution | ▶ Analog inputs | Bit | 12 |
| | ▶ Analog outputs ⁷⁾ | Bit | 10 |
| Actual pressure value Input ⁹⁾ | ▶ Analog voltage | V | 0 ... 10 |
| | ▶ Analog current | mA | 0 ... 20 ⁶⁾ |
| Ambient temperature range at the pump | | °C | 0 ... +60 |
| Storage temperature range (pump + electronics) | | °C | +5 ... +40 0 ... +40 |
| Electronics design | | Integrated at pilot control valve (OBE) | |
| Protection class according to EN 60529 | ▶ Pump incl. pilot control valve | IP65 (with correctly installed electrical connection) | |

⁶⁾ Maximum admissible input current 30 mA for configuration on current input.

⁷⁾ Outputs are parameterizable for type SYDFED and SYDFEF. For the condition as supplied see "Electrical connection."

⁸⁾ Supply voltage is used directly for the sensor connections X2M1, X2M2 and X8M with type SYDFED and SYDFEF (no internal voltage limitation).

⁹⁾ – Type VT-DFPD: XH4, pin 10 and 11 (only voltage 0 ... 10 V)
– Type VT-DFPF: XH1: pin D and E

Notice:

- ▶ For information on environment simulation testing for the fields EMC (electro-magnetic compatibility), climate and mechanical load, see data sheet 29016.
- ▶ For system versions with attached hoses ("0479" and "0487"), please observe the information in the operating instructions, chapter "Maintenance."

Electrical connection: Type SYDFEE► **X1, central connection****Assignment of connector or mating connector and cable set**

| Pin | Signal | Description | Signal direction | Type of signal | Assignment in cable set (accessories) |
|------|-------------------------|--|------------------|---------------------------------|---------------------------------------|
| 1 | + U_B | Voltage supply | IN | 24 V DC | 1 |
| 2 | 0 V = L0 | Reference potential for the voltage supply | – | – | 2 |
| PE | Ground | Grounding connection for the electronics | – | – | green/yellow |
| 3 | Fault | Signals faults, e.g., cable break command/ actual values, controller monitoring (logic 0 = error) | OUT | logic 24 V | white |
| 4 | M0 | Reference potential for analog signals | – | – | yellow |
| 5 | α Command | Swivel angle command value | IN | analog \pm 10 V | green |
| 6 | α Actual | Actual swivel angle value, normalized | OUT | analog \pm 10 V | violet |
| 7 | ρ Command | Pressure command value | IN | analog 0 ... 10 V | pink |
| 8 | ρ Actual | Actual pressure value, normalized | OUT | analog 0 ... 10 V ¹⁾ | red |
| 9 | | Function depends on type of electronics and additional function, see below | – | – | brown |
| 10 | Actual pressure value H | Actual pressure value input: Signal level depends on pos. 14 in the ordering code. With version "F" (0.5 ... 5 V) reserved | IN | analog | black |
| 11 | Actual pressure value L | | – | analog | blue |
| n.c. | | | | | gray |

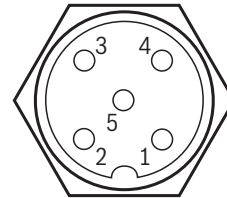
Supply line
3 x 1.0 mm²Supply line
10 x 0.14 mm²
shielded (one end
of the shield must
be connected to
the control)**Functions at pin 9**

| Pin | Additional function | Function dependent on pos. 7 of the ordering code (order, see ordering code) | Signal direction | Type of signal |
|-----|---------------------|--|------------------|-------------------|
| 9 | "A" | Selecting a different oil volume adjustment (switch T_D) | 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 |

¹⁾ When using a pressure transducer with raised zero point (e.g., 4 ... 20 mA), a voltage of –1 ... –2.5 V will be output in case of a cable break.

► **X2, connection of pressure transducer HM 20**

| Pin | Signal HM 20 | Pin | |
|-----|---------------------------|-----|------|
| 1 | OUT, + U_B | 2 | n.c. |
| 3 | Reference L0 | | |
| 4 | IN, analog, 0.5 ... 5 VDC | 5 | n.c. |

**Notice:**

- Mating connectors can be ordered separately, see page 39.
- Electrical connection for type SYDFE1 see data sheet 30242.

Electrical connection: Type SYDFED

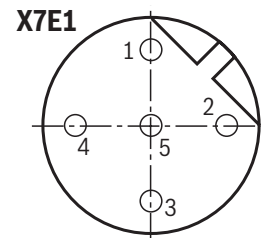
► XH4, central connection

Assignment of connector or mating connector and cable set

| Pin | Signal | Description | Signal direction | Type of signal | Assignment in 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 | Ground | Grounding connection for the electronics | – | – | green/yellow | |
| 3 | DO | Switching output 24 V max. 1.5 A Factory setting: Error signal | 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 2 (or digital input, configuration via software) | IN | analog ±10 V (digital 24 V) | green | |
| 6 | AO2 | Analog output 2 Factory setting: Actual swivel angle value, normalized | OUT | analog ±10 V or 0 ... 20 mA ¹⁾ | violet | |
| 7 | AI1 | Analog input 1 (or digital input, configuration via software) | IN | analog ± 10 V (digital 24 V) | pink | |
| 8 | AO1 | Analog output 1 Factory setting: Actual pressure value, normalized | OUT | analog ±10 V or 0 ... 20 mA ¹⁾ | red | |
| 9 | DI | Digital input (use freely configurable) | IN | logic 24 V | brown | |
| 10 | Actual pressure value H | Actual pressure value input (analog input 8): Signal level depends on parameter setting. Factory setting dependent on pos. 14 of the ordering code: 0 ... 10 V (V) or deactivated (F) | IN | analog 0 ... 10 V (freely configurable) | black | |
| 11 | Actual pressure value L | | – | analog | blue | |
| n.c. | | | | | gray | |

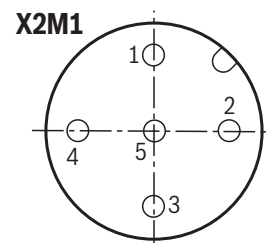
► X7E1 and X7E2, connector pin assignment for Ethernet interface (coding D), M12, 4-pole, socket

| Pin | Assignment |
|-----|------------|
| 1 | TxD + |
| 2 | RxD + |
| 3 | TxD – |
| 4 | RxD – |
| 5 | Not used |



► X2M1 and X2M2, analog configurable sensor interface (coding A), M12, 5-pole, socket

| Pin | Assignment |
|-----|---|
| 1 | +24 V voltage output (sensor supply) ²⁾ |
| 2 | Sensor signal input current (4 ... 20 mA) ³⁾ |
| 3 | GND |
| 4 | Sensor signal input voltage (0 ... 10 V) ³⁾ |
| 5 | Negative differential amplifier input to pin 4 (optional) |



- 1) If the analog inputs AI1 and AI2 are not used, the analog outputs AO1 and AO2 may be parameterized as current outputs (e.g., if the command value presetting is realized via the field bus).
- 2) Maximum load capacity 50 mA, voltage output same as voltage supply connected to input XH4.
- 3) Only one signal input configurable per interface



Notice:

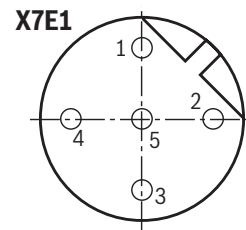
- X2N, reserved (not used)
- X8A, actual swivel angle value input (coding A), M12, 5-pole, socket M12
- Mating connectors can be ordered separately, see page 39.

Electrical connection: Type SYDFEF► **XH1, central connection****Assignment of connector or mating connector and cable set**

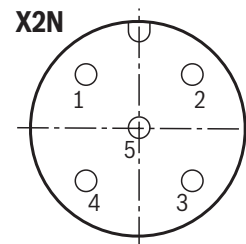
| Pin | Signal | Description | Signal direction | Type of signal | Assignment in cable set (accessories) | |
|-----|-----------------|--|------------------|------------------------------|---------------------------------------|--|
| A | +U _B | Voltage supply | IN | 24 VDC | brown | Line 7 x 0.75 mm ² shielded (one end of the shield must be connected to the control) |
| B | 0 V = L0 | Reference potential for the voltage supply | – | – | yellow | |
| PE | Ground | Grounding connection for the electronics | – | – | green/yellow | |
| C | – | Do not use | – | – | green | |
| D | AI1 | Analog input 1 (freely-configurable) | IN | analog ± 10 V or 0 ... 20 mA | blue | |
| E | M0 | Reference potential for analog signals | – | – | gray | |
| F | AO1 | Analog output 1 (freely-configurable) | OUT | analog ± 10 V or 0 ... 20 mA | white | |

► **X7E1 and X7E2, connector pin assignment for Ethernet interface (coding D), M12, 4-pole, socket**

| Pin | Assignment |
|-----|------------|
| 1 | TxD + |
| 2 | RxD + |
| 3 | TxD – |
| 4 | RxD – |
| 5 | Not used |

► **X2N, analog configurable sensor interface (coding A), M12, 5-pole, socket**

| Pin | Assignment |
|-----|--|
| 1 | +24 V voltage output (sensor supply) ¹⁾ |
| 2 | Analog input voltage 2 (0 ... 10 V) |
| 3 | GND |
| 4 | Analog input voltage 4 (0 ... 10 V) |
| 5 | Analog input voltage 3 (0 ... 10 V) |



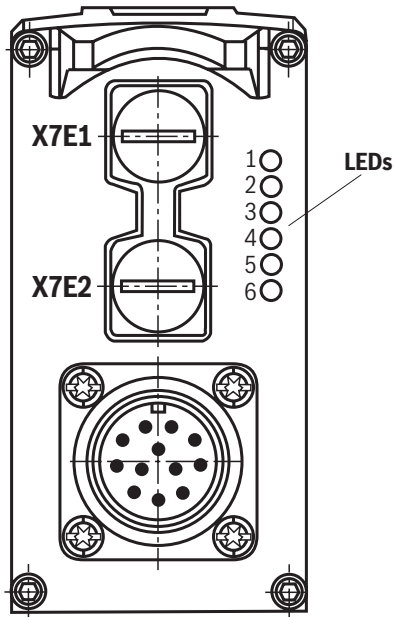
¹⁾ Maximum load capacity 3 x 25 mA, voltage output same as voltage supply connected to input XH1.

Notice:

- X8A1, actual swivel angle value input (coding A), M12, 5-pole, socket M12
- Mating connectors can be ordered separately, see page 39.

LED indicators: Type SYDFED

| LED | Interface | Sercos | EtherNET/IP | EtherCAT | PROFINET RT | POWERLINK | VARAN |
|-----|---------------------------|---------------|----------------|----------------|----------------|--------------------|----------------|
| 1 | X7E1 | Activity | Activity | not used | Activity | not used | Active |
| 2 | | Link | Link | Link/activity | Link | Link/data activity | Link |
| 3 | Electronics module | S | Network status | Network status | Network status | Status/error | Network status |
| 4 | | Module status | Module status | Module status | Module status | Module status | Module status |
| 5 | X7E2 | Activity | Activity | not used | Activity | not used | not used |
| 6 | | Link | Link | Link/activity | Link | Link/data activity | not used |

**Meaning of the status LEDs**

| Network status LED (LED 3) | Indicated status |
|-------------------------------------|------------------|
| See functional description 30338-FK | |

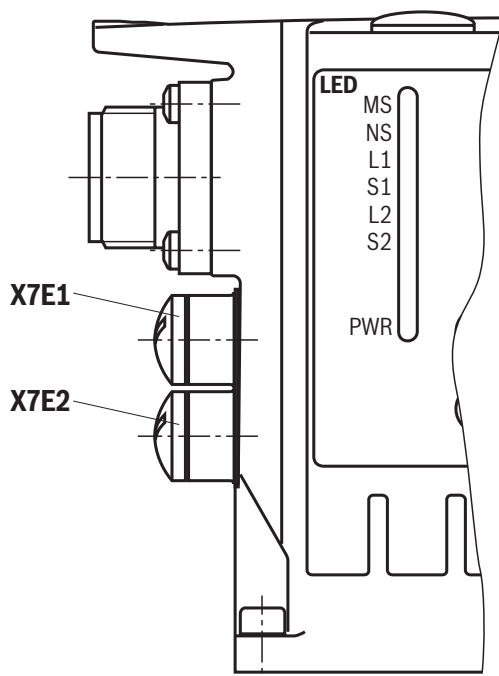
| Module status LED (LED 4) | Indicated status |
|---------------------------|---------------------------|
| Off | No voltage supply |
| Green-red, flashing | Self-test |
| Green, flashing | Drive ready for operation |
| Green | In control |
| Orange, flashing | Warning |
| Red, flashing | Error |

Notice:

- ▶ For the connection to the M12 sockets, we recommend using self-locking mating connectors
- ▶ LEDs 1, 2, 5 and 6 relate to interfaces "X7E1" and "X7E2"
 - Link: Cable plugged in, connection established (permanently lit)
 - Activity: Data sent/received (flashing)
- ▶ The network status LED 3 (NS) indicates the status of the control communication.
- ▶ Module status LED 4 relates to the electronics module
- ▶ For a detailed description of the diagnosis LEDs, please refer to the functional description Rexroth HydraulicDrive HDx.

LED indicators: Type SYDFEF

| LED | Interface | Sercos | EtherNET/IP | EtherCAT | PROFINET RT | VARAN |
|-----|--------------------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| MS | Electronics module | Module status | Module status | Module status | Module status | Module status |
| NS | | S | Network status and others | Network status and others | Network status and others | Network status and others |
| L1 | X7E1 | Link and others | Link and others | Link/activity | Link and others | Link and others |
| S1 | | Activity and others | Activity and others | not used | Activity and others | Active and others |
| L2 | X7E2 | Link and others | Link and others | Link/activity | Link and others | not used |
| S2 | | Activity and others | Activity and others | not used | Activity and others | not used |
| PWR | XH1 | Power | Power | Power | Power | Power |

**Meaning of the status LEDs**

| Power LED (LED PWR) | Indicated status |
|---------------------|-------------------|
| Off | No voltage supply |
| Green | Operation |

| Module status LED (LED MS) | Indicated status |
|----------------------------|---------------------------|
| Off | No voltage supply |
| Green-red, flashing | Initialization |
| Green, flashing | Drive ready for operation |
| Green | Drive active |
| Orange, flashing | Warning |
| Red, flashing | Error |
| Green, rapidly flashing | Firmware must be loaded |

Notice:

- ▶ For the connection to the M12 bushes, we recommend using self-locking mating connectors
- ▶ The MS module status LED relates to the electronics module
- ▶ The NS network status LED indicates the status of the control communication, see application description 30338-FK
- ▶ LEDs L1, S1, L2 and S2 relate to interfaces "X7E1" and "X7E2"
 - Link: Cable plugged in, connection established (permanently lit)
 - Activity: Data sent/received (flashing)
- ▶ For a detailed description of the diagnosis LEDs, please refer to the functional description Rexroth HydraulicDrive HDx.

Control loop quality

| | Swivel angle control | Pressure control ¹⁾ |
|---------------------|----------------------|--------------------------------|
| Linearity tolerance | ≤ 1.0% | ≤ 1.5% (≤ 1.0% ²⁾) |
| Temperature error | ≤ 0.5% / 10 K | ≤ 0.5% / 10 K |
| Hysteresis | ≤ 0.2% | ≤ 0.2% |
| Repetition accuracy | ≤ 0.2% | ≤ 0.2% |

- 1) Without considering the pump pulsation
- 2) With SYDFED and SYDFEF using the integrated calibration function

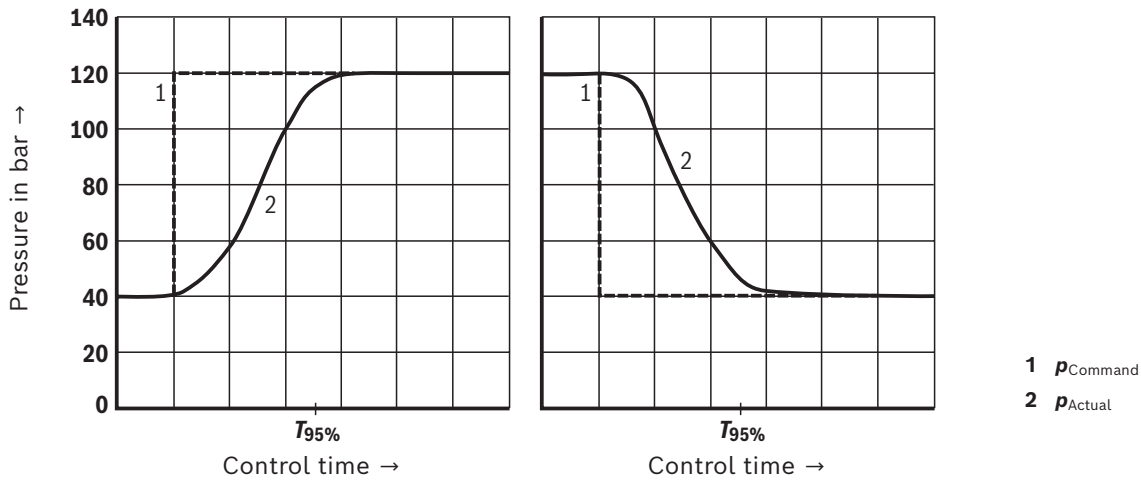
Notice:

- ▶ The specified values are only valid when using the system components specified in this data sheet (see page 39).
- ▶ At pressures <20 bar, higher tolerances have to be anticipated due to lower actuating forces.

Characteristic curves

(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Transition function for pressure command value step (control spool version "A")



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

| Hydraulic fluid volume in l | $T_{95\%}$ in ms |
|-----------------------------|------------------|
| <5 | 150 |
| 5 ... 10 | 200 |
| 15 ... 25 | 250 |

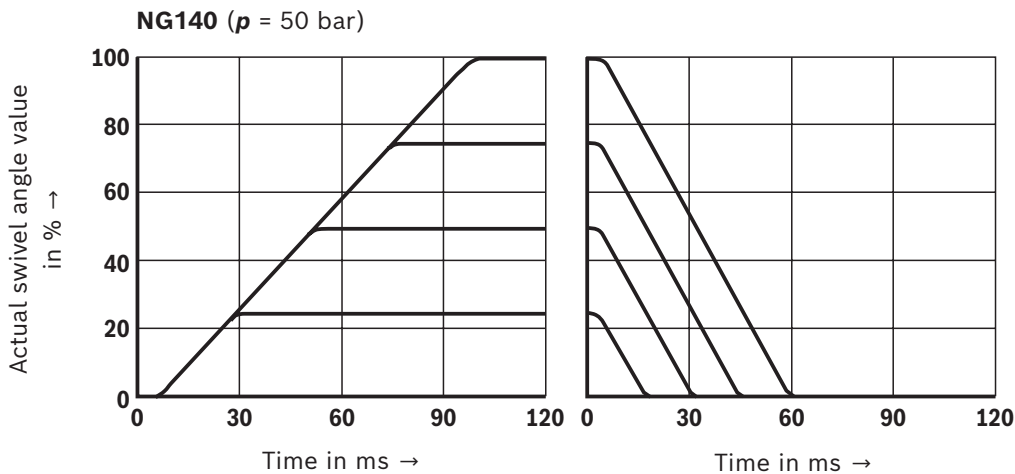
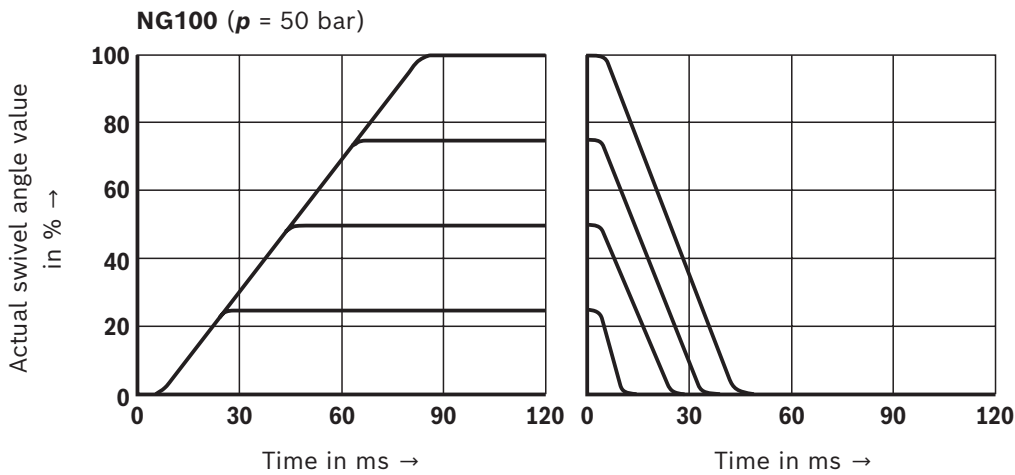
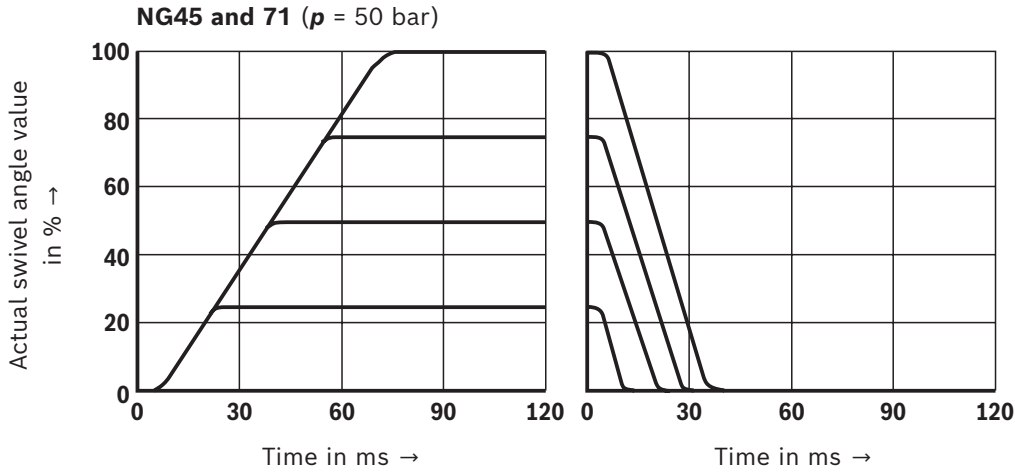
Notice:

- ▶ For pressures up to 40 bar, the values of the response times are greater.
- ▶ 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.

Characteristic curves

(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

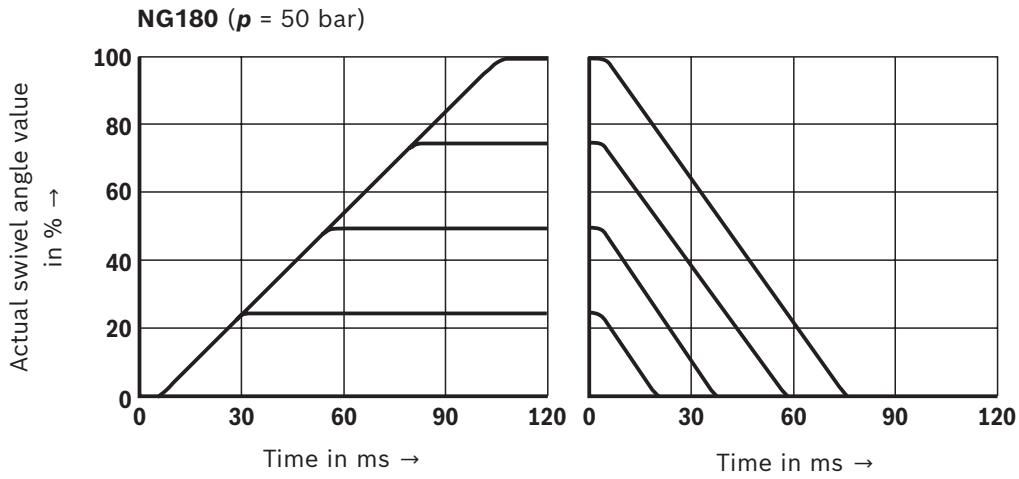
Transition function with swivel angle command value step (control spool version "A")



Characteristic curves

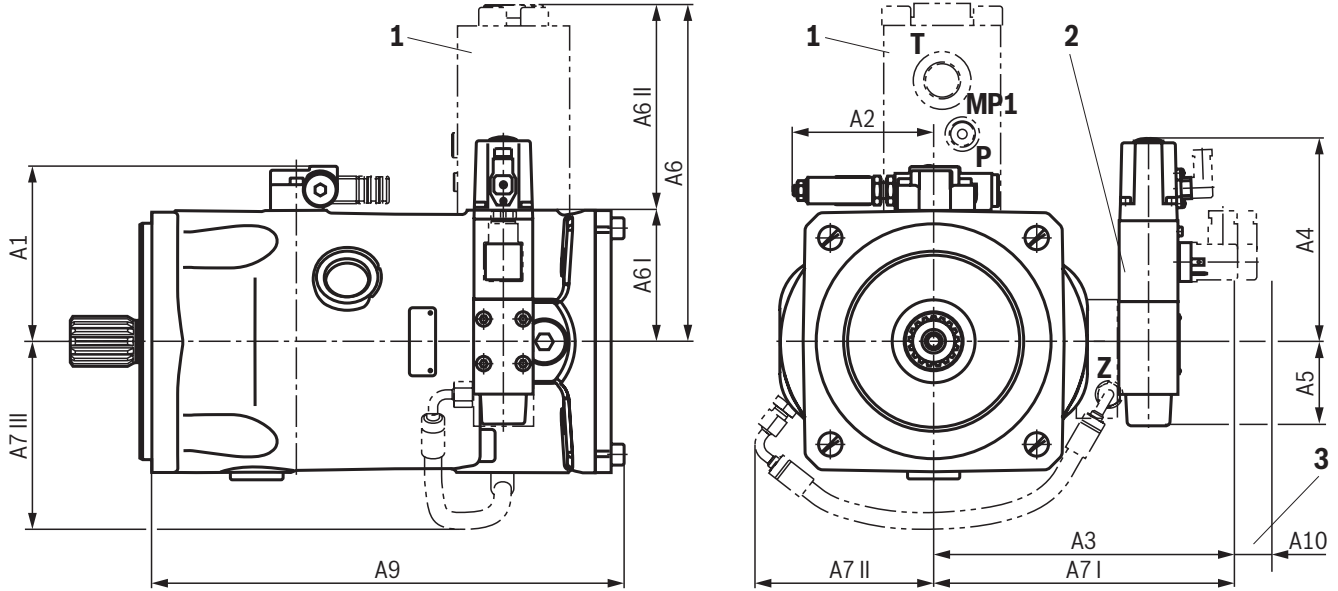
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Transition function with swivel angle command value step (control spool version "A")



Dimensions: Type SYDFE1
(dimensions in mm)

NG45 ... 180 (installation orientation "0"; shaft design "S" or "R"; with universal through-drive "U.."; representation NG100)



- 1 Preload valve (optional)
- 2 Pilot control valve attachment with clockwise direction of rotation
- 3 Space required for removing the mating connector

| NG | A1 | A2 | A3 ¹⁾ | A4 | A5 | A6 | A6 I | A6 II | Version "0479" and "0487" | | | A9 | A10 | Z |
|-----|-----|-----|------------------|-----|----|-----|------|-------|------------------------------|-------|--------|-----|-----|------|
| | | | | | | | | | A7 I | A7 II | A7 III | | | |
| 45 | 112 | 110 | 181 | 158 | 63 | 206 | 91 | 115 | 216 | 145 | 125 | 266 | 15 | G1/4 |
| 71 | 124 | 110 | 189 | 158 | 63 | 254 | 104 | 150 | 224 | 159 | 150 | 301 | 15 | G1/4 |
| 100 | 129 | 110 | 200 | 158 | 63 | 247 | 100 | 147 | 235 | 164 | 150 | 360 | 15 | G1/4 |
| 140 | 140 | 110 | 213 | 158 | 63 | 257 | 110 | 147 | 248 | 182 | 150 | 377 | 15 | G1/4 |
| 180 | 140 | 110 | 213 | 158 | 63 | 257 | 110 | 147 | 248 | 182 | 150 | 387 | 15 | G1/4 |

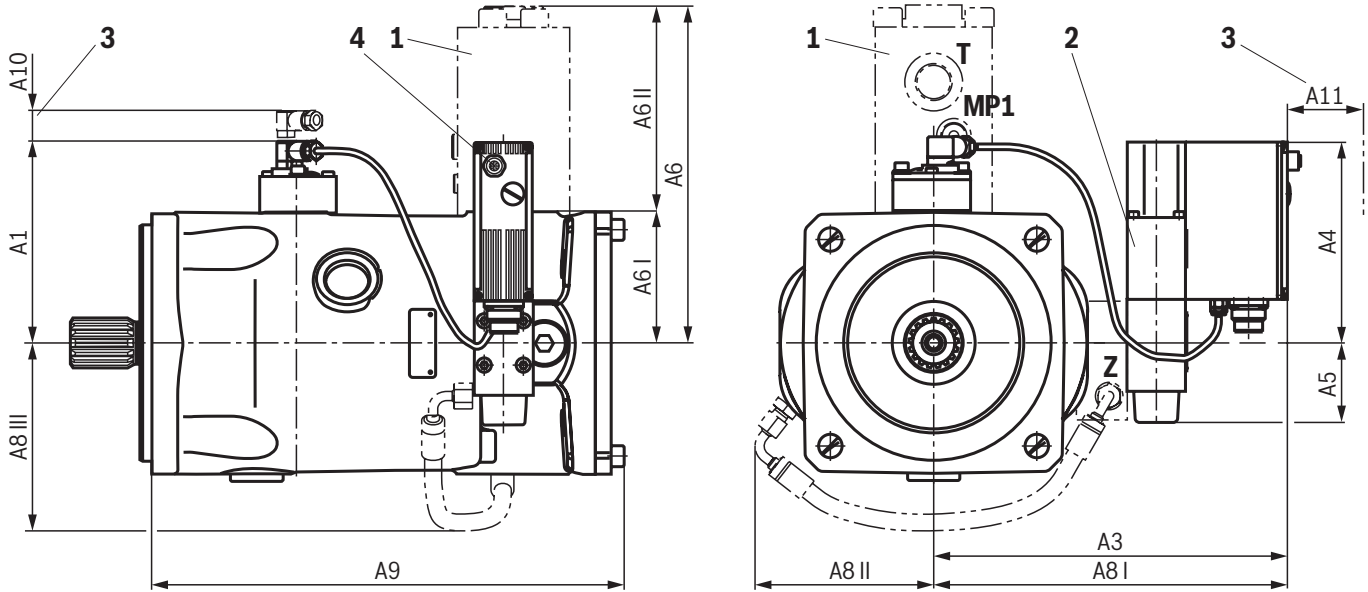
1) Version "0000" and "0541"

Notice:

For the dimensions of the base pump (axial piston variable displacement pump A10VSO.../32) see data sheet 92714.

Dimensions: Type SYDFEE (installation orientation "0")
(dimensions in mm)

NG45 ... 180 (installation orientation "0"; shaft design "S" or "R"; with universal through-drive "U."; representation NG100)



- 1 Preload valve (optional)
- 2 Pilot control valve attachment with clockwise direction of rotation
- 3 Space required for removing the mating connector
- 4 Port X2 (pressure transducer HM 20) with actual pressure value input "F."

| NG | A1 | A3 ¹⁾ | A4 | A5 | A6 | A6 I | A6 II | Version "0479" and "0487" | | | A9 | A10 | A11 | Z |
|-----|-----|------------------|-----|----|-----|------|-------|------------------------------|-------|--------|-----|-----|-----|------|
| | | | | | | | | A8 I | A8 II | A8 III | | | | |
| 45 | 134 | 218 | 158 | 63 | 206 | 91 | 115 | 253 | 145 | 125 | 266 | 8 | 100 | G1/4 |
| 71 | 146 | 226 | 158 | 63 | 254 | 104 | 150 | 261 | 159 | 150 | 301 | 8 | 100 | G1/4 |
| 100 | 151 | 237 | 158 | 63 | 247 | 100 | 147 | 272 | 164 | 150 | 360 | 8 | 100 | G1/4 |
| 140 | 162 | 250 | 158 | 63 | 257 | 110 | 147 | 285 | 182 | 150 | 377 | 8 | 100 | G1/4 |
| 180 | 162 | 250 | 158 | 63 | 257 | 110 | 147 | 285 | 182 | 150 | 387 | 8 | 100 | G1/4 |

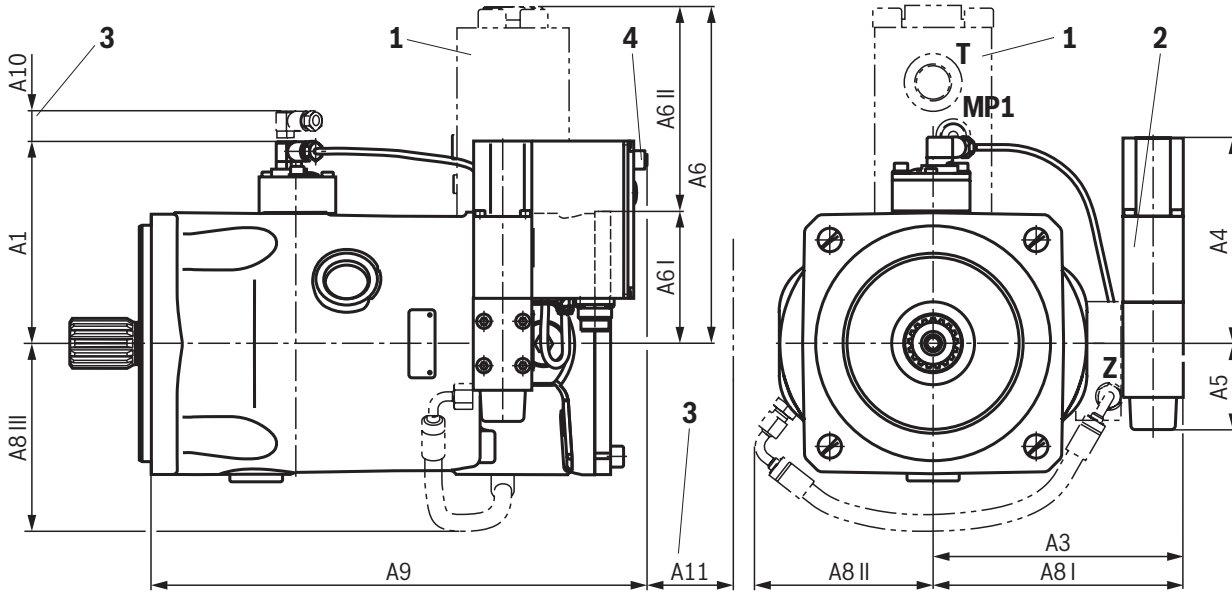
1) Version "0000" and "0541"

Notice:

For the dimensions of the base pump (axial piston variable displacement pump A10VSO.../32) see data sheet 92714.

Dimensions: Type SYDFEE (installation orientation "2")
(dimensions in mm)

NG45 ... 180 (installation orientation "2"; shaft design "S" or "R"; with universal through-drive "U.."; representation NG100)



- 1 Preload valve (optional)
- 2 Pilot control valve attachment with clockwise direction of rotation
- 3 Space required for removing the mating connector
- 4 Port X2 (pressure transducer HM 20) with actual pressure value input "F."

| NG | A1 | A3 ¹⁾ | A4 | A5 | A6 | A6 I | A6 II | Version "0479" and "0487" | | | A9 | A10 | A11 | Z |
|-----|-----|------------------|-----|----|-----|------|-------|------------------------------|-------|--------|-----|-----|-----|------|
| | | | | | | | | A8 I | A8 II | A8 III | | | | |
| 45 | 134 | 138 | 158 | 63 | 206 | 91 | 115 | 173 | 145 | 125 | 287 | 8 | 100 | G1/4 |
| 71 | 146 | 146 | 158 | 63 | 254 | 104 | 150 | 181 | 159 | 150 | 316 | 8 | 100 | G1/4 |
| 100 | 151 | 157 | 158 | 63 | 247 | 100 | 147 | 192 | 164 | 150 | 372 | 8 | 100 | G1/4 |
| 140 | 162 | 170 | 158 | 63 | 257 | 110 | 147 | 205 | 182 | 150 | 382 | 8 | 100 | G1/4 |
| 180 | 162 | 170 | 158 | 63 | 257 | 110 | 147 | 205 | 182 | 150 | 392 | 8 | 100 | G1/4 |

¹⁾ Version "0000" and "0541"

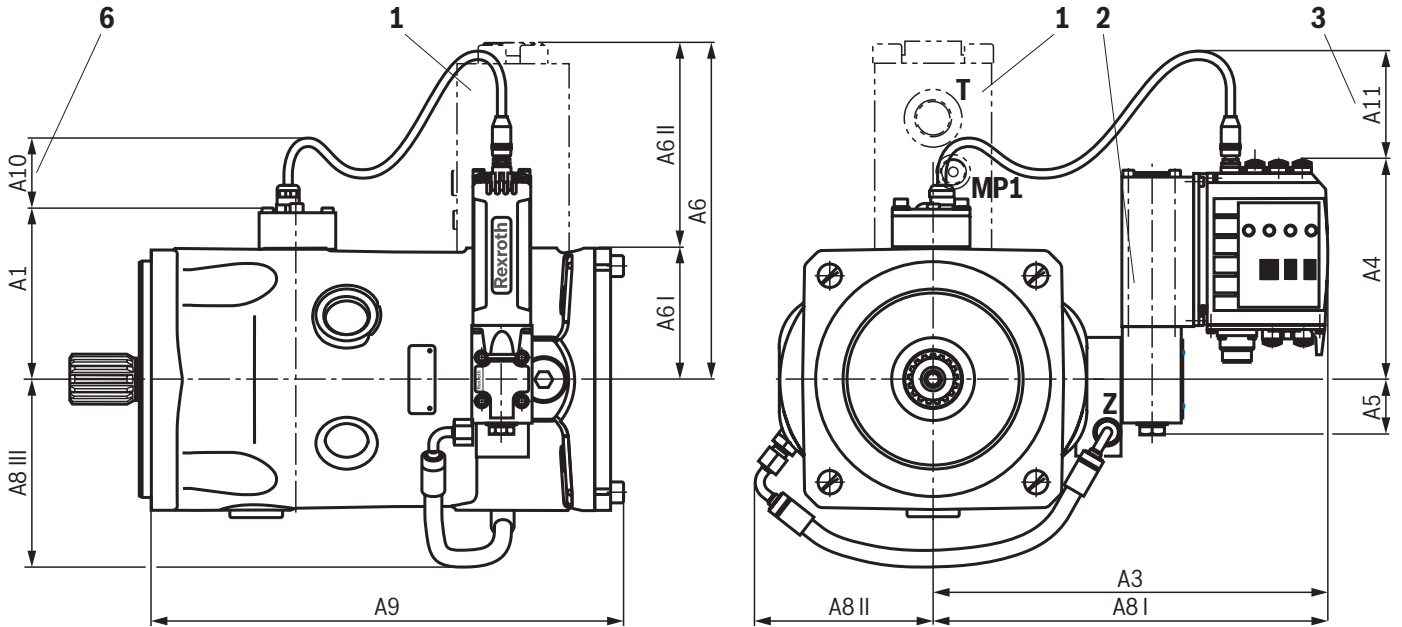


Notice:

For the dimensions of the base pump (axial piston variable displacement pump A10VSO.../32) see data sheet 92714.

Dimensions: Type SYDFED (installation orientation "0")
(dimensions in mm)

NG45 ... 180 (installation orientation "0"; shaft design "S" or "R"; with universal through-drive "U.."; representation NG100)



- 1 Preload valve (optional)
- 2 Pilot control valve attachment with clockwise direction of rotation
- 3 Space required for removing the mating connector
- 6 Space required for the connection line

| NG | A1 | A3 ¹⁾ | A4 | A5 | A6 | A6 I | A6 II | Version "0479" and "0487" | | | A9 | A10 | A11 | Z |
|-----|-----|------------------|-----|----|-----|------|-------|------------------------------|-------|--------|-----|-----|-----|------|
| | | | | | | | | A8 I | A8 II | A8 III | | | | |
| 45 | 114 | 251 | 166 | 43 | 206 | 91 | 115 | 286 | 145 | 125 | 266 | 60 | 100 | G1/4 |
| 71 | 126 | 259 | 166 | 43 | 254 | 104 | 150 | 294 | 159 | 150 | 301 | 60 | 100 | G1/4 |
| 100 | 131 | 270 | 166 | 43 | 247 | 100 | 147 | 305 | 164 | 150 | 360 | 60 | 100 | G1/4 |
| 140 | 142 | 294 | 166 | 43 | 257 | 110 | 147 | 329 | 182 | 150 | 377 | 60 | 100 | G1/4 |
| 180 | 142 | 294 | 166 | 43 | 257 | 110 | 147 | 329 | 182 | 150 | 387 | 60 | 100 | G1/4 |

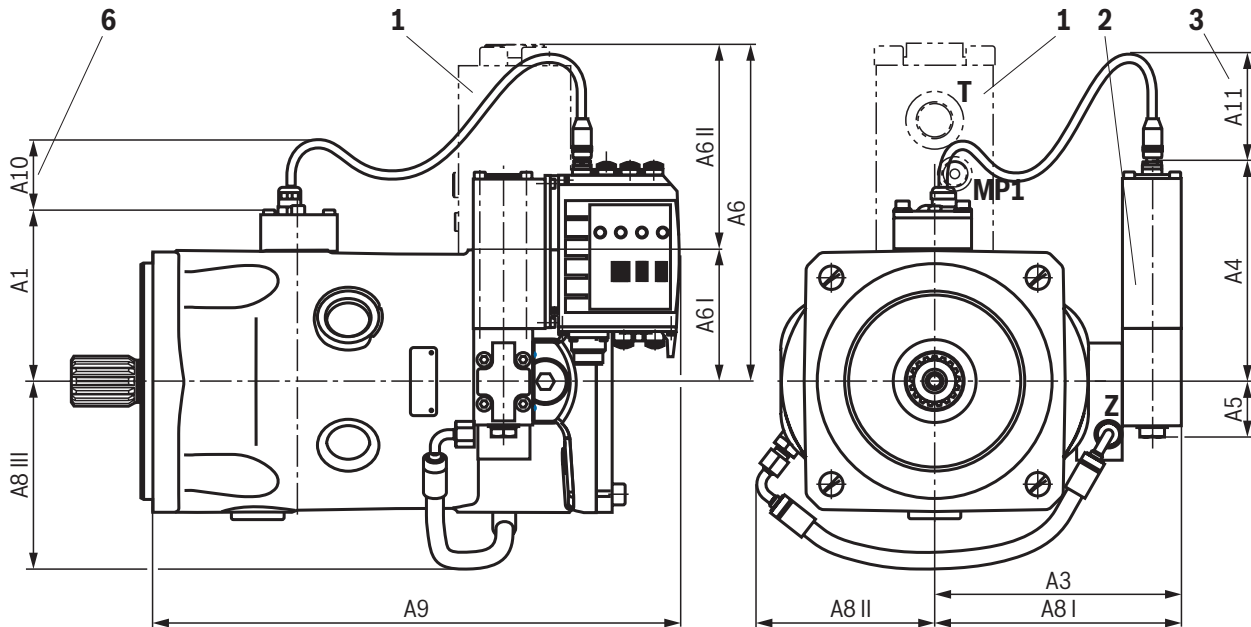
1) Version "0000" and "0541"

Notice:

For the dimensions of the base pump (axial piston variable displacement pump A10VSO.../32) see data sheet 92714.

Dimensions: Type SYDFED (installation orientation "2")
(dimensions in mm)

NG45 ... 180 (installation orientation "2"; shaft design "S" or "R"; with universal through-drive "U.."; representation NG100)



- 1 Preload valve (optional)
- 2 Pilot control valve attachment with clockwise direction of rotation
- 3 Space required for removing the mating connector
- 6 Space required for the connection line

| NG | A1 | A3 ¹⁾ | A4 | A5 | A6 | A6 I | A6 II | Version "0479" and "0487" | | | A9 | A10 | A11 | Z |
|-----|-----|------------------|-----|----|-----|------|-------|------------------------------|-------|--------|-----|-----|-----|------|
| | | | | | | | | A8 I | A8 II | A8 III | | | | |
| 45 | 114 | 137 | 166 | 43 | 206 | 91 | 115 | 172 | 145 | 125 | 322 | 60 | 100 | G1/4 |
| 71 | 126 | 145 | 166 | 43 | 254 | 104 | 150 | 180 | 159 | 150 | 351 | 60 | 100 | G1/4 |
| 100 | 131 | 156 | 166 | 43 | 247 | 100 | 147 | 191 | 164 | 150 | 407 | 60 | 100 | G1/4 |
| 140 | 142 | 180 | 166 | 43 | 257 | 110 | 147 | 215 | 182 | 150 | 417 | 60 | 100 | G1/4 |
| 180 | 142 | 180 | 166 | 43 | 257 | 110 | 147 | 215 | 182 | 150 | 427 | 60 | 100 | G1/4 |

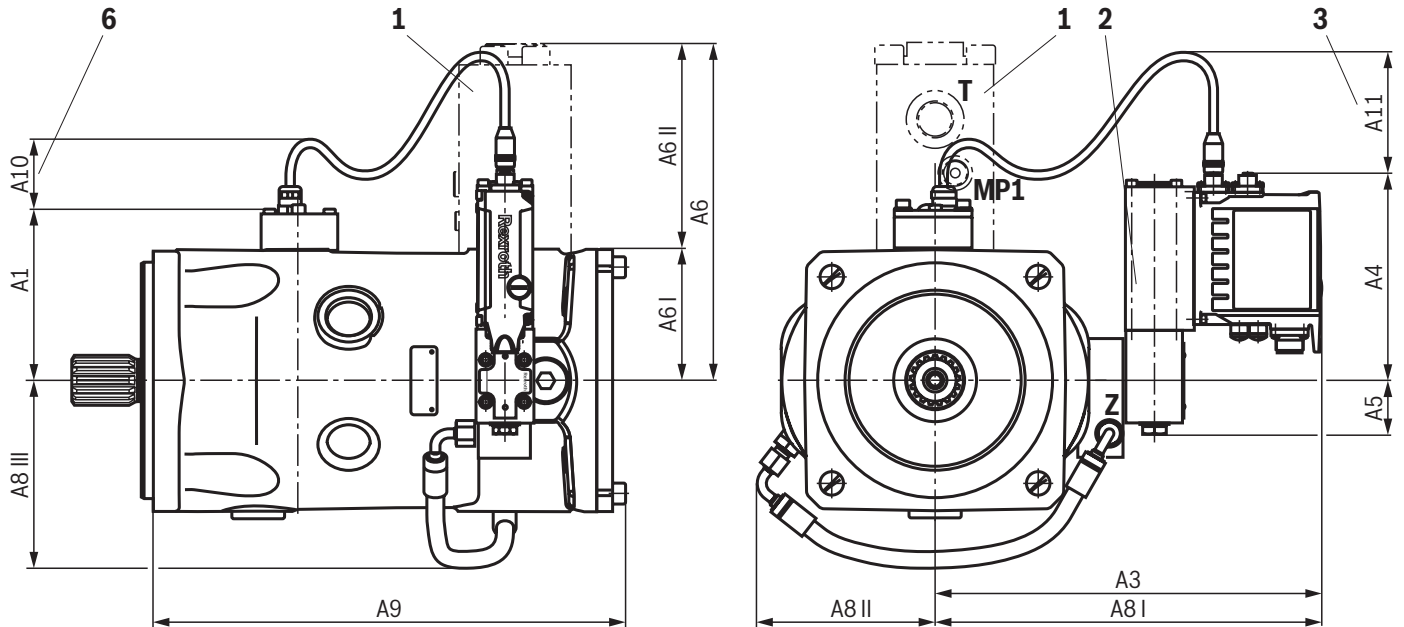
¹⁾ Version "0000" and "0541"

Notice:

For the dimensions of the base pump (axial piston variable displacement pump A10VSO.../32) see data sheet 92714.

Dimensions: Type SYDFEF (installation orientation "0")
(dimensions in mm)

NG45 ... 180 (installation orientation "0"; shaft design "S" or "R"; with universal through-drive "U.."; representation NG100)



- 1 Preload valve (optional)
- 2 Pilot control valve attachment with clockwise direction of rotation
- 3 Space required for removing the mating connector
- 6 Space required for the connection line

| NG | A1 | A3 ¹⁾ | A4 | A5 | A6 | A6 I | A6 II | Version "0479" and "0487" | | | A9 | A10 | A11 | Z |
|-----|-----|------------------|-----|----|-----|------|-------|------------------------------|-------|--------|-----|-----|-----|------|
| | | | | | | | | A8 I | A8 II | A8 III | | | | |
| 45 | 114 | 249 | 166 | 43 | 206 | 91 | 115 | 284 | 145 | 125 | 266 | 60 | 100 | G1/4 |
| 71 | 126 | 257 | 166 | 43 | 254 | 104 | 150 | 292 | 159 | 150 | 301 | 60 | 100 | G1/4 |
| 100 | 131 | 268 | 166 | 43 | 247 | 100 | 147 | 303 | 164 | 150 | 360 | 60 | 100 | G1/4 |
| 140 | 142 | 292 | 166 | 43 | 257 | 110 | 147 | 327 | 182 | 150 | 377 | 60 | 100 | G1/4 |
| 180 | 142 | 292 | 166 | 43 | 257 | 110 | 147 | 327 | 182 | 150 | 387 | 60 | 100 | G1/4 |

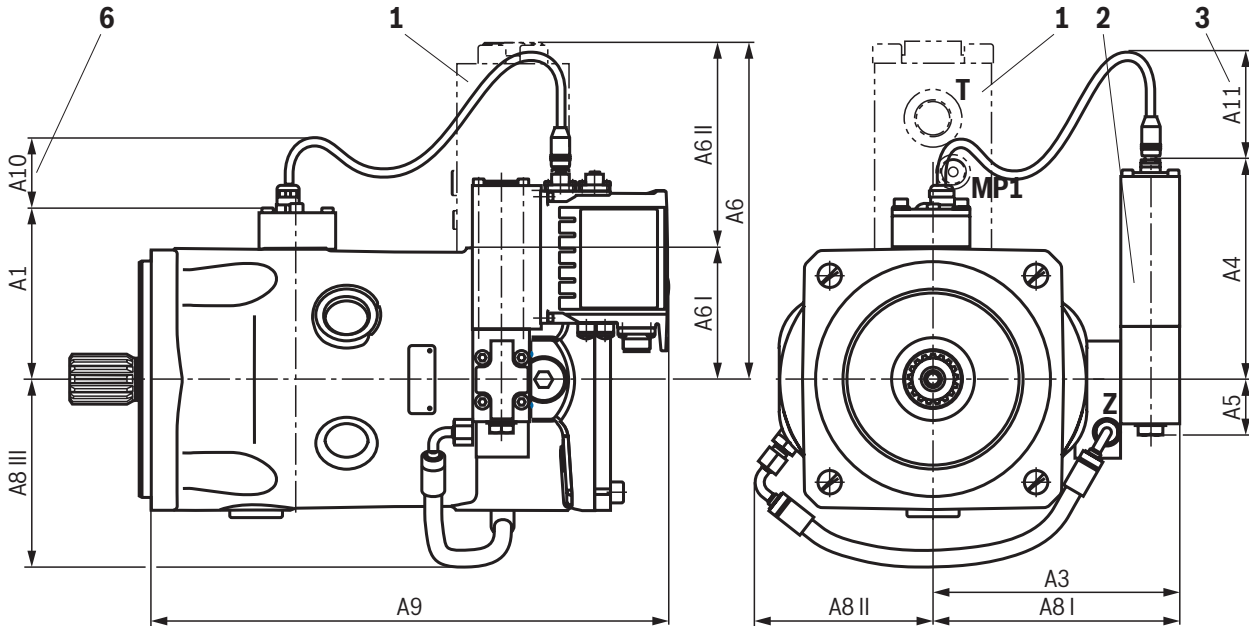
1) Version "0000" and "0541"

Notice:

For the dimensions of the base pump (axial piston variable displacement pump A10VSO.../32) see data sheet 92714.

Dimensions: Type SYDFEF (installation orientation "2")
(dimensions in mm)

NG45 ... 180 (installation orientation "2"; shaft design "S" or "R"; with universal through-drive "U.."; representation NG100)



- 1 Preload valve (optional)
- 2 Pilot control valve attachment with clockwise direction of rotation
- 3 Space required for removing the mating connector
- 6 Space required for the connection line

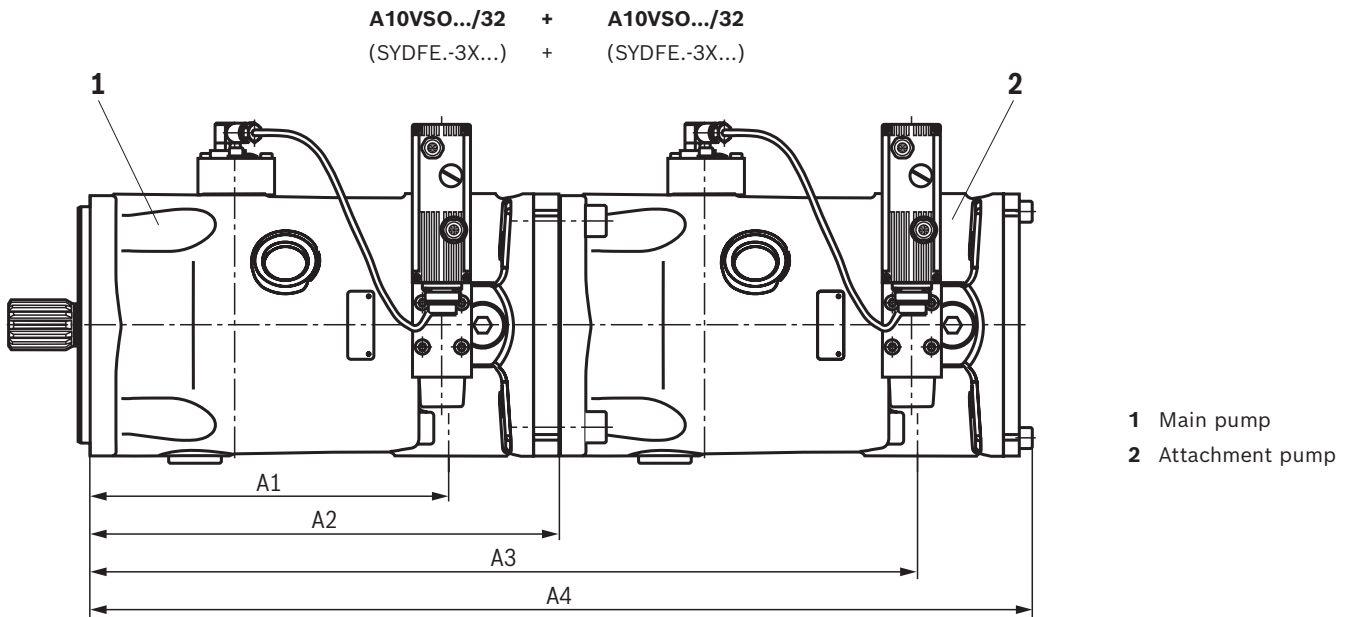
| NG | A1 | A3 ¹⁾ | A4 | A5 | A6 | A6 I | A6 II | Version "0479" and "0487" | | | A9 | A10 | A11 | Z |
|-----|-----|------------------|-----|----|-----|------|-------|------------------------------|-------|--------|-----|-----|-----|------|
| | | | | | | | | A8 I | A8 II | A8 III | | | | |
| 45 | 114 | 137 | 166 | 43 | 206 | 91 | 115 | 172 | 145 | 125 | 320 | 60 | 100 | G1/4 |
| 71 | 126 | 145 | 166 | 43 | 254 | 104 | 150 | 180 | 159 | 150 | 349 | 60 | 100 | G1/4 |
| 100 | 131 | 156 | 166 | 43 | 247 | 100 | 147 | 191 | 164 | 150 | 405 | 60 | 100 | G1/4 |
| 140 | 142 | 180 | 166 | 43 | 257 | 110 | 147 | 215 | 182 | 150 | 415 | 60 | 100 | G1/4 |
| 180 | 142 | 180 | 166 | 43 | 257 | 110 | 147 | 215 | 182 | 150 | 425 | 60 | 100 | G1/4 |

¹⁾ Version "0000" and "0541"

Notice:

For the dimensions of the base pump (axial piston variable displacement pump A10VSO.../32) see data sheet 92714.

Dimensions: Combination pumps BR32
(dimensions in mm)



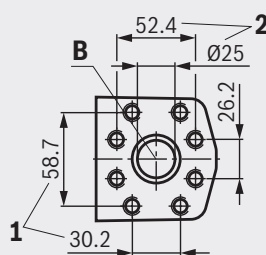
| Attachment pump | | Main pump | | | | | | | | | | | | | | | | | | | |
|-----------------|------|-----------|-----|-----|-----|-----------|-----|-----|-----|------------|-----|-----|-----|------------|-----|-----|-----|------------|-----|-----|-----|
| | | A10VSO 45 | | | | A10VSO 71 | | | | A10VSO 100 | | | | A10VSO 140 | | | | A10VSO 180 | | | |
| A1 | A2 | A3 | A4 | A1 | A2 | A3 | A4 | A1 | A2 | A3 | A4 | A1 | A2 | A3 | A4 | A1 | A2 | A3 | A4 | | |
| A10VSO 18 | BR31 | 184 | 264 | 409 | 459 | 217 | 299 | 444 | 494 | 275 | 360 | 505 | 555 | 275 | 377 | 522 | 572 | 285 | 387 | 532 | 582 |
| A10VSO 28 | BR31 | 184 | 264 | 428 | 470 | 217 | 299 | 463 | 505 | 275 | 360 | 524 | 566 | 275 | 377 | 541 | 583 | 285 | 387 | 551 | 593 |
| A10VSO 45 | BR31 | | | | | 217 | 299 | 483 | 523 | 275 | 360 | 544 | 584 | 275 | 377 | 561 | 601 | 285 | 387 | 571 | 611 |
| A10VSO 45 | BR32 | 184 | 264 | 448 | 530 | 217 | 299 | 483 | 565 | 275 | 360 | 544 | 626 | 275 | 377 | 561 | 643 | 285 | 387 | 571 | 653 |
| A10VSO 71 | BR32 | | | | | 217 | 299 | 516 | 600 | 275 | 360 | 577 | 661 | 275 | 377 | 594 | 678 | 285 | 387 | 604 | 688 |
| A10VSO 100 | BR32 | | | | | | | | | 275 | 360 | 635 | 720 | 275 | 377 | 652 | 737 | 285 | 387 | 662 | 747 |
| A10VSO 140 | BR32 | | | | | | | | | | | | | 275 | 377 | 652 | 754 | 285 | 387 | 662 | 764 |
| A10VSO 180 | BR32 | | | | | | | | | | | | | | | | | 285 | 387 | 672 | 774 |

Dimensions: Connections
(dimensions in mm)

| Size | | 45 | 71 | 100 | 140 | 180 |
|---|-------------------------------|---------------------|----|---------------------|--------|--------|
| B | ► Size | 1" | 1" | 1 1/4" | 1 1/4" | 1 1/4" |
| Working line (SAE J518 ¹⁾) | ► Mounting thread (DIN 13) | M10 x 1,5; 17 deep | | M14 x 2; 19 deep | | |
| | ► Peak pressure ²⁾ | bar 350 | | | | |
| S | ► Size | 1 1/2" | 2" | 2 1/2" | 2 1/2" | 2 1/2" |
| Suction line (SAE J518 ¹⁾) | ► Mounting thread (DIN 13) | M12 x 1.75; 20 deep | | M12 x 1.75; 17 deep | | |
| | ► Peak pressure ²⁾ | bar 10 | | | | |

Notices regarding size 71:

- For pressure connection B, two SAE fastening connections rotated by 90° are available. SAE 1 1/4" standard pressure series, 3000 psi, for pressures up to 250 bar or SAE 1" standard pressure series, 5000 psi, for pressures up to 350 bar.
- For operating pressures exceeding 250 bar, the pressure flange SAE 1" must be used.



¹⁾ Dimensions according to SAE J518 only, metric mounting thread deviating from the standard.

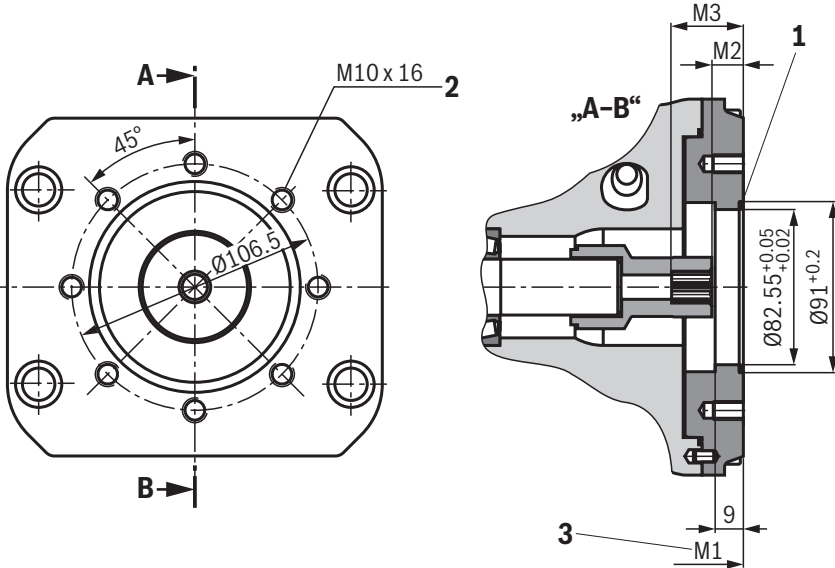
²⁾ Application-specific short-time pressure peaks may occur. Please observe when selecting measuring devices and fittings. Specified pressures are in bar absolute.

- 1 SAE 1 1/4"
- 2 SAE 1"

Dimensions: Through-drives
(dimensions in mm)

► **"U52" Flange** ISO 3019-1-82-2

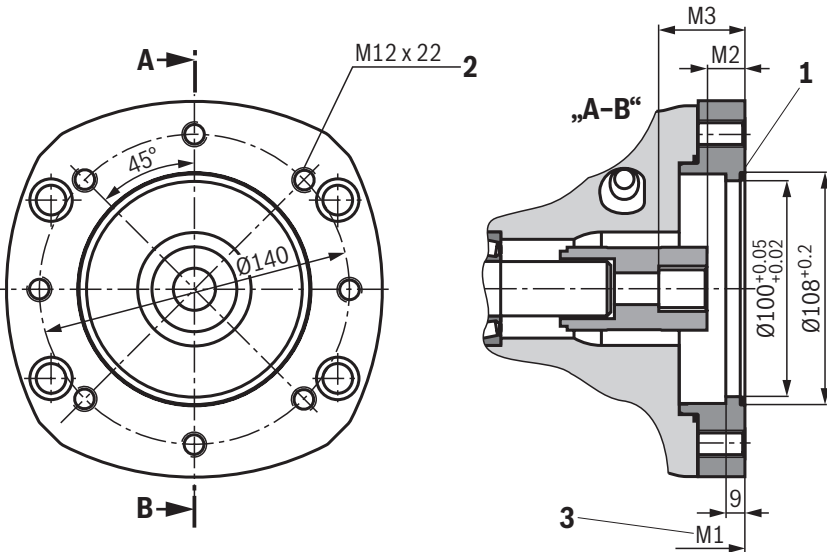
Hub for splined shaft acc. to ANSI B92.1a-1996 – 3/4" 11T 16/32DP ¹⁾ (SAE J744 - 19-4 (A-B))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 45 | 264 | 19 | 39.4 |
| 71 | 299 | 20.8 | 41.2 |
| 100 | 360 | 19 | 40 |
| 140 | 377 | 18.6 | 39.6 |
| 180 | 387 | 18.9 | 39.9 |

► **"UB3" Flange** ISO 3019-2 - 100B2HW

Hub for splined shaft acc. to ANSI B92.1a-1996 – 7/8" 13T 16/32DP ¹⁾ (SAE J744 - 22-4 (B))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 45 | 264 | 18 | 42.4 |
| 71 | 299 | 19.8 | 44.2 |
| 100 | 360 | 18 | 42.3 |
| 140 | 377 | 17.6 | 41.9 |
| 180 | 387 | 17.9 | 42.2 |

- 1 Seal ring (included in the scope of delivery)
- 2 Thread according to DIN 13
- 3 Up to pump mounting face

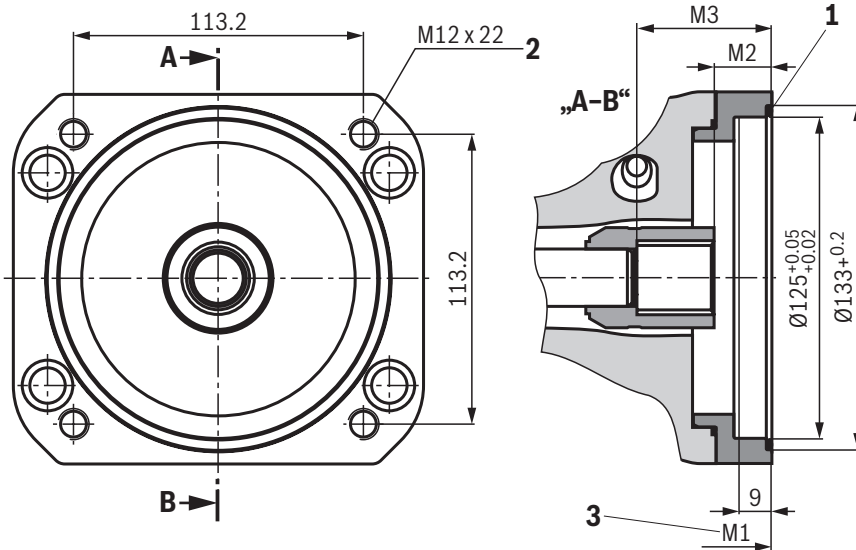
Notice:
Before determining the design, please request a binding installation drawing.

¹⁾ 30° pressure angle, flat root, side fit, tolerance class 5

Dimensions: Through-drives
(dimensions in mm)

► **"UE1" Flange** ISO 3019-2 - 125, 4-hole

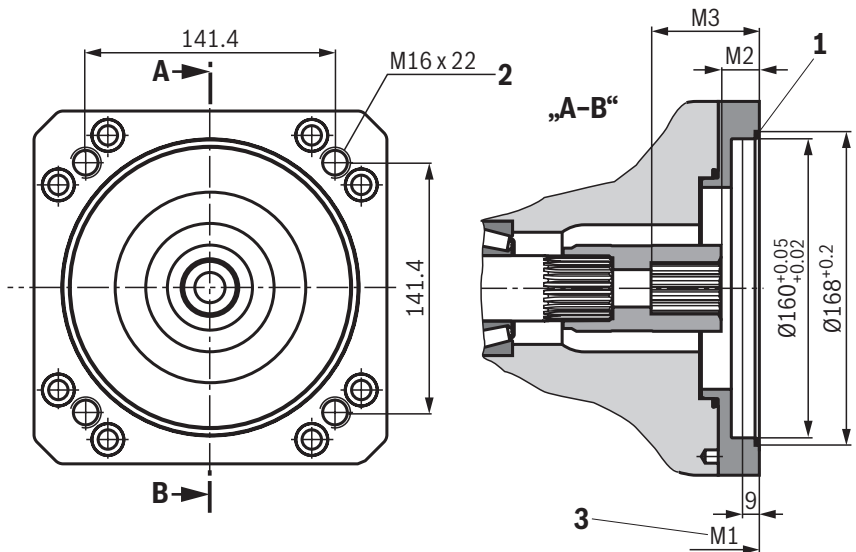
Hub for splined shaft according to ANSI B92.1a-1996 – 1" 15T 16/32DP ¹⁾ (SAE J744 - 25-4 (B-B))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 45 | 264 | 18.5 | 48.0 |
| 71 | 299 | 20.3 | 49.2 |
| 100 | 360 | 18.2 | 47.0 |
| 140 | 377 | 18.1 | 47.6 |
| 180 | 387 | 18.4 | 47.9 |

► **"UB8" Flange** ISO 3019-2 - 160B4HW

Hub for splined shaft acc. to ANSI B92.1a-1996 – 1 1/4" 14T 12/24DP ¹⁾ (SAE J744 - 32-4 (C))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 71 | 299 | 20.3 | 58.3 |
| 100 | 360 | 19.5 | 57.5 |
| 140 | 377 | 19.1 | 56.4 |
| 180 | 387 | 19.4 | 56.7 |

- 1 Seal ring (included in the scope of delivery)
- 2 Thread according to DIN 13
- 3 Up to pump mounting face

Notice:

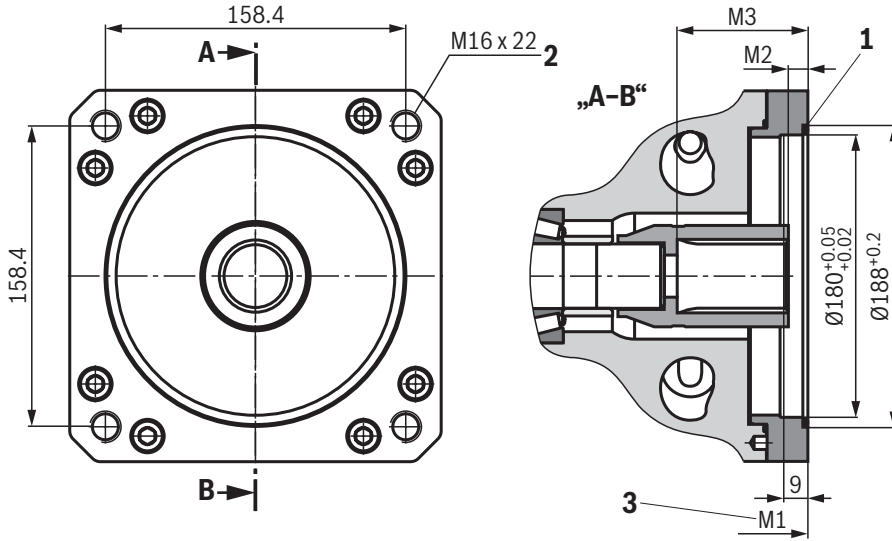
Before determining the design, please request a binding installation drawing.

¹⁾ 30° pressure angle, flat root, side fit, tolerance class 5

Dimensions: Through-drives
(dimensions in mm)

► **"UB9" Flange ISO 3019-2 - 180B4HW**

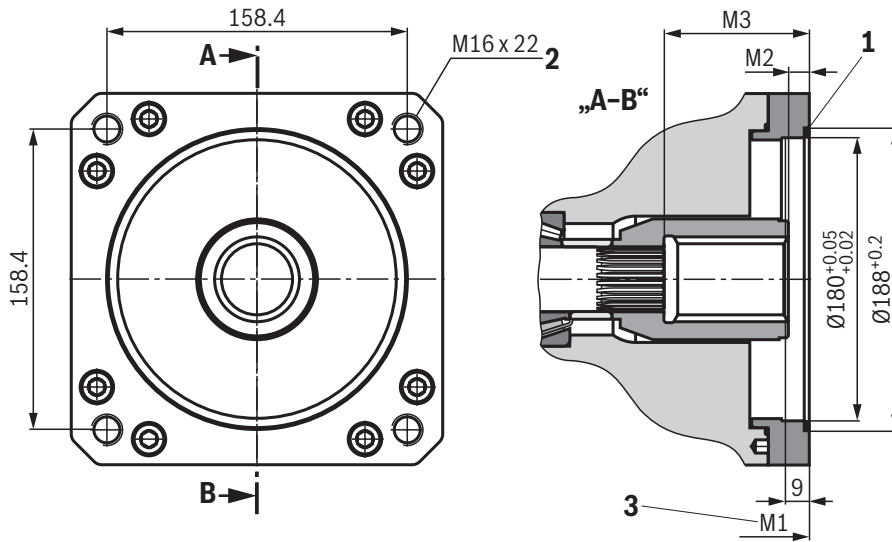
Hub for splined shaft acc. to ANSI B92.1a-1996 – 1 1/2" 17T 12/24DP ¹⁾ (SAE J744 - 38-4 (C-C))



| NG | M1 | M2 | M3 |
|-----|-----|-----|------|
| 100 | 360 | 21 | 63 |
| 140 | 377 | 9.6 | 68.6 |
| 180 | 387 | 9.9 | 68.9 |

► **"UB7" Flange ISO 3019-2 - 180B4HW**

Hub for splined shaft acc. to ANSI B92.1a-1996 – 1 3/4" 13T 8/16DP ¹⁾ (SAE J744 - 44-4 (D))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 140 | 377 | 9.3 | 75.9 |
| 180 | 387 | 10.4 | 76.4 |

- 1 Seal ring (included in the scope of delivery)
- 2 Thread according to DIN 13
- 3 Up to pump mounting face

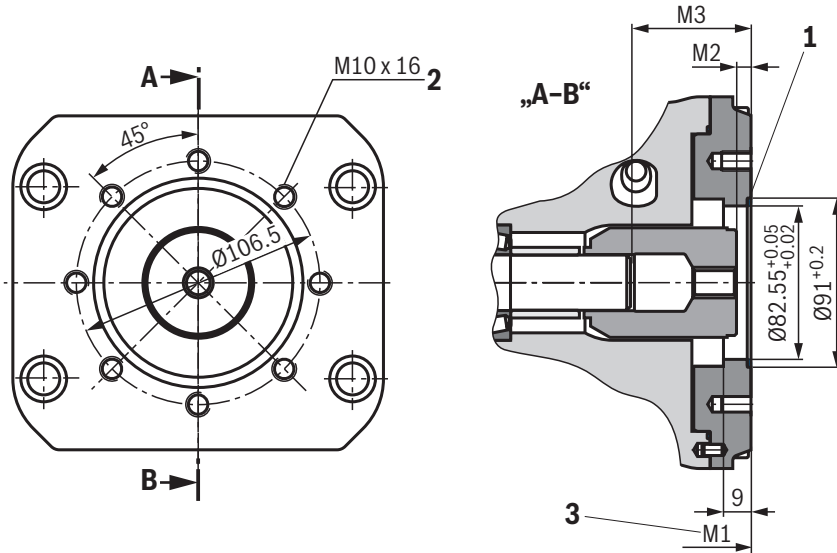
Notice:
Before determining the design, please request a binding installation drawing.

¹⁾ 30° pressure angle, flat root, side fit, tolerance class 5

Dimensions: Through-drives
(dimensions in mm)

► **"U01"** Flange ISO 3019-1-82-2

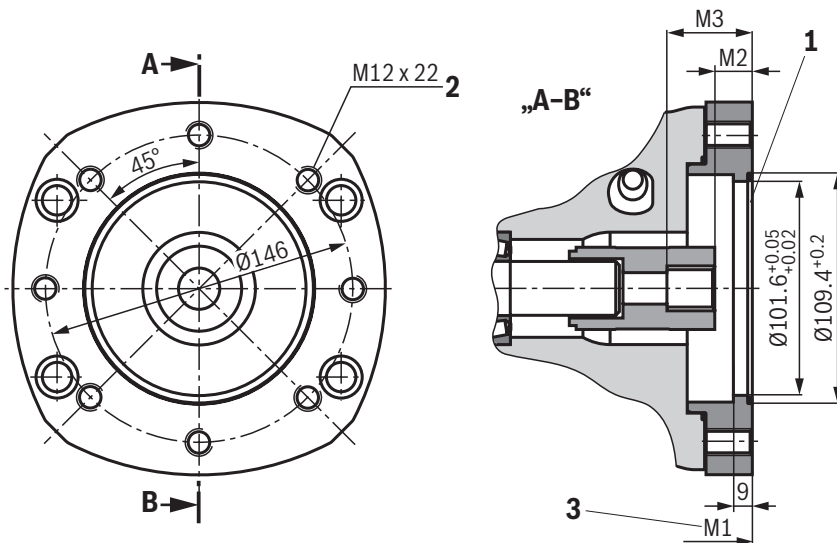
Hub for splined shaft acc. to ANSI B92.1a-1996 – 5/8" 9T 16/32DP ¹⁾ (SAE J744 - 16-4 (A))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 45 | 264 | 21.2 | 53.3 |
| 71 | 299 | 8.4 | 60.6 |
| 100 | 360 | 9.7 | 64.7 |
| 140 | 377 | 9.7 | 76.8 |
| 180 | 387 | 10.8 | 77.1 |

► **"U68"** Flange ISO 3019-1-101-2

Hub for splined shaft acc. to ANSI B92.1a-1996 – 7/8" 13T 16/32DP ¹⁾ (SAE J744 - 22-4 (B))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 45 | 264 | 18 | 42.4 |
| 71 | 299 | 19.8 | 44.2 |
| 100 | 360 | 18 | 42.3 |
| 140 | 377 | 17.6 | 41.9 |
| 180 | 387 | 17.9 | 42.2 |

- 1 Seal ring (included in the scope of delivery)
- 2 Thread according to DIN 13
- 3 Up to pump mounting face

Notice:

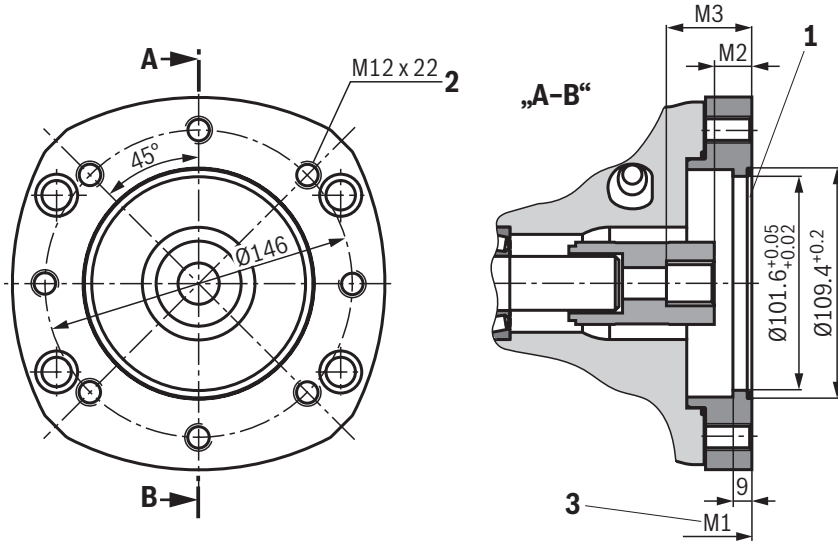
Before determining the design, please request a binding installation drawing.

¹⁾ 30° pressure angle, flat root, side fit, tolerance class 5

Dimensions: Through-drives
(dimensions in mm)

► **"U04" Flange** ISO 3019-1-101-2

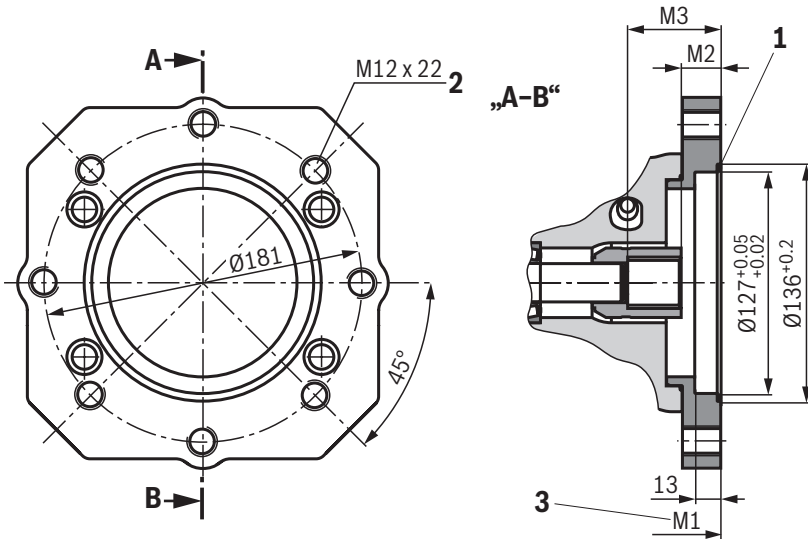
Hub for splined shaft acc. to ANSI B92.1a-1996 – 1" 15T 16/32DP ¹⁾ (SAE J744 - 25-4 (B-B))



| NG | M1 | M2 | M3 |
|-----|-----|------|------|
| 45 | 264 | 18.5 | 48 |
| 71 | 299 | 20.3 | 49.2 |
| 100 | 360 | 18.2 | 47 |
| 140 | 377 | 18.1 | 47.6 |
| 180 | 387 | 18.4 | 47.9 |

► **"U24" Flange** ISO 3019-1-127-2

Hub for splined shaft acc. to ANSI B92.1a-1976 – 1 1/2" 17T 12/24DP ¹⁾ (SAE J744 - 38-4 (C-C))



| NG | M1 | M2 | M3 |
|-----|-----|-----|------|
| 100 | 360 | 21 | 63 |
| 140 | 377 | 9.6 | 68.6 |
| 180 | 387 | 9.9 | 68.9 |

- 1 Seal ring (included in the scope of delivery)
- 2 Thread according to DIN 13
- 3 Up to pump mounting face

Notice:
Before determining the design, please request a binding installation drawing.

¹⁾ 30° pressure angle, flat root, side fit, tolerance class 5

Torsionally flexible couplings for attachment to a standard electric motor

| Motor | | SYDFE.-3X | | | |
|--|-------------------------|----------------------------------|---|---------------------------------------|--|
| Frame size/ characteristic value | Shaft diameter in mm | NG45 Splined shaft "R," 1" | NG71 Splined shaft "S" or "R," 1 1/4" | NG100 Splined shaft "S," 1 1/2" | NG140, 180 Splined shaft "S," 1 3/4" |
| 100/0, 112/0 | 28 | R901038017 | | | |
| 132/0 | 38 | R900772898 | | | |
| 160/0 | 42 | R900994283 | R900228413 | | |
| 180/0 | 48 | R900062159 | R900240468 | R900242567 | |
| 200/0 | 55 | R901038025 | R901038021 | R901104689 | R901038048 |
| 225/0 | 60 | R901066409 | R900228375 | R901050508 | R900988121 |
| 250/0 | 65 | R900988348 | R900986404 | R901046864 | R900708084 |
| 280/0 | 75 | | R900218487 | R901055216 | R901052451 |
| 315/0 | 80 | | | R901046894 ¹⁾ | R901041730 ¹⁾ |
| 315/1 | 80 | | | | R901046885 |

¹⁾ Up to 40 °C

Accessories for through-drives

With the introduction of A10VSO, series 32, a universal through-drive for combining several pump stages is used. The required components can be found in the following table and are to be ordered separately. The pumps with universal through-drive are closed at the factory with an end cover to ensure reliable operation.

The following conditions apply to the attachment pumps listed in the table:

- ▶ SYDFE and A10VSO with shaft "S" or "R"
- ▶ 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

Flange and through-drive (see ordering code page 2) must be the same. Check in the current data sheet of the gear pump whether the shaft ends have the same specified dimensions.

Attachment kits for universal through-drive

| Main pump SYDFE...3X/..U.. | | | | | Attachment pump | | | |
|-------------------------------|------------|------------|------------|------------|------------------------|------------------------------------|--------------------------------|--------------------------|
| NG45 | NG71 | NG100 | NG140 | NG180 | Size and type | | Through-drive centering hub | Flange designation |
| R902496472 | R902496473 | R902496474 | R902496475 | R902496475 | NG18 | SYDFE...2X/ A10 VSO / BR31 | "U52" 82.55 mm 3/4" | ISO 3019-1-82-2 |
| R902492531 | R902512434 | R902496445 | R902496446 | R902496446 | NG28 | | "UB3" 100 mm 7/8" | ISO 3019-2 100B2HW |
| R902510125 | R902510126 | R902510127 | R902510129 | R902510129 | NG45 | SYDFE...3X/..U.. A10 VSO / BR32 | "UE1" 125 mm 1" | ISO 3019-2 125B4HW |
| | R902496458 | R902496459 | R902496460 | R902496461 | NG71 | | "UB8" 160 mm 1 1/4" | ISO 3019-2 160B4HW |
| | | R902496462 | R902496463 | R902496464 | NG100 | | "UB9" 180 mm 1 1/2" | ISO 3019-2 180B4HW |
| | | | R902496465 | R902496466 | NG140 | | "UB7" 180 mm 1 3/4" | ISO 3019-2 180B4HW |
| | | | | R902496466 | NG180 | | | |
| R902496467 | R902496468 | R902496469 | R902496470 | R902496471 | PGF2, PGH2, PGH3, AZPF | | "U01" 82.55 mm 5/8" | ISO 3019-1-82-2 |
| R902496477 | R902496478 | R902496479 | R902496480 | R902496481 | PGF3 | | "U68" 101.6 mm 7/8" | ISO 3019-1-101-2 |
| R902496482 | R902496663 | R902496664 | R902496665 | R902496666 | PGH4 | | "U04" 101.6 mm 1" | ISO 3019-1-101-2 |
| | | R902510136 | R902510137 | R902510138 | PGH5 | | "U24" 127 mm 1 1/2" | ISO 3019-1-127-2 |

 **Note:**

Combinations are only possible with shaft ends according to SAE J744.

Accessories (separate order)

| SYDFE1 | Material number | Data sheet |
|---|------------------------|-------------------|
| External control electronics VT 5041-3X/1 without power limitation, without swivel angle display | R901236404 | 30242 |
| External control electronics VT 5041-3X/2 without power limitation, with swivel angle display | R901263598 | 30242 |
| External control electronics VT 5041-3X/3 with power limitation, with swivel angle display | R901196678 | 30242 |
| Mating connector for solenoid plug | R901017011 | 08006 |
| Mating connector for position transducer of valve | R900023126 | 08006 |
| Mating connector for position transducer of pump | R900013674 | - |
| Pressure transducer HM 20-2X, measurement range 315 bar (4 ... 20 mA) | R901342029 | 30272 |
| Pressure transducer HM 20-2X, measurement range 315 bar (0.1 ... 10 V) | R901342030 | 30272 |
| Card holder VT 3002-1-2X/32D | R900020153 | 29928 |
| Compact power supply unit VT-NE32-1X | R900080049 | 29929 |
| SYDFEE | Material number | Data sheet |
| 12-pole mating connector for central connection X1 without cable (assembly kit) | R900884671 | 08006 |
| 12-pole mating connector for central connection X1 with cable set 2 x 5 m | R900032356 | - |
| 12-pole mating connector for central connection X1 with cable set 2 x 20 m | R900860399 | - |
| Pressure transducer HM 20-2X, measurement range 315 bar (4 ... 20 mA) | R901342029 | 30272 |
| Pressure transducer HM 20-2X, measurement range 315 bar (0.1 ... 10 V) | R901342030 | 30272 |
| Pressure transducer HM 20-2X, measurement range 315 bar (0.5 ... 5 V) with 0.5 m cable | R901342038 | 30272 |
| Test device VT-PDFE-1-1X/V0/0 | R900757051 | 29689-B |
| Compact power supply unit VT-NE32-1X | R900080049 | 29929 |
| SYDFED | Material number | Data sheet |
| 12-pole mating connector for central connection XH4 without cable (assembly kit) | R900884671 | 08006 |
| 12-pole mating connector for central connection XH4 with cable set 2 x 5 m | R900032356 | - |
| 12-pole mating connector central connection XH4 with cable set 2 x 20 m | R900860399 | - |
| Pressure transducer HM 20-2X, measurement range 315 bar (4 ... 20 mA) | R901342029 | 30272 |
| Pressure transducer HM 20-2X, measurement range 315 bar (0.1 ... 10 V) | R901342030 | 30272 |
| Pressure transducer HM 20-2X, measurement range 315 bar (0.5 ... 5 V) with 0.5 m cable | R901342038 | 30272 |
| Test device VT-PDFE-1-1X/V0/0 | R900757051 | 29689-B |
| Compact power supply unit VT-NE32-1X | R900080049 | 29929 |
| Ethernet connection cable M12 to RJ45 (connection X7E1 & X7E2), additional information type designation RKB0044/xxx.x (xxx.x: length in meters) | R911172135 | - |
| Commissioning software IndraWorks DS from version 14V14 | - | - |
| SYDFEF | Material number | Data sheet |
| 6-pole mating connector for central connection XH1 without cable (assembly kit) | R900021267 | 08006 |
| 6-pole mating connector for central connection XH1 with cable set 3 m | R901420483 | 08006 |
| 6-pole mating connector for central connection XH1 with cable set 5 m | R901420491 | 08006 |
| 6-pole mating connector for central connection XH1 with cable set 10 m | R901420496 | 08006 |
| Pressure transducer HM 20-2X, measurement range 315 bar (4 ... 20 mA) | R901342029 | 30272 |
| Pressure transducer HM 20-2X, measurement range 315 bar (0.1 ... 10 V) | R901342030 | 30272 |
| Pressure transducer HM 20-2X, measurement range 315 bar (0.5 ... 5 V) with 0.5 m cable | R901342038 | 30272 |
| Ethernet connection cable M12 to RJ45 (connection X7E1 & X7E2), additional information type designation RKB0044/003,0 | R911343806 | - |
| Commissioning software IndraWorks DS from version 14V14 | - | - |

Project planning information

- ▶ Always shield command and actual value cables.
- ▶ The distance to aerial lines or radios must be at least 1 m.
- ▶ Do not lay signal lines close to power lines.
- ▶ For further information on the SYDFE control system, see the operating instructions (see "Further information").

Further information

- ▶ Operating instructions for SY(H)DFE1
 - ▶ Operating instructions for SY(H)DFEE
 - ▶ Operating instructions for SY(H)DFED
 - ▶ Operating instructions for SY(H)DFEF
 - ▶ Data sheet for axial piston variable displacement pump A10VSO../32
 - ▶ Data sheet for external control electronics VT 5041-3X for SYDFE1
 - ▶ Data sheet for pilot control valve VT-DFP.-2X
 - ▶ Data sheet for pump preload valve SYDZ 0001-1X
 - ▶ Data sheet for swivel angle sensor VT-SWA-1-1X
 - ▶ Data sheet for pressure transducer HM 20-2X
 - ▶ Axial piston variable displacement pump universal through-drive
 - ▶ Operating instructions for test device VT-PDFE
 - ▶ Internet
 - ▶ Information on available spares
- Operating instructions 30011-B
 - Operating instructions 30012-B
 - Operating instructions 30017-B
 - Operating instructions 30013-B
 - Data sheet 92714
 - Data sheet 30242
 - Data sheet 29016
 - Data sheet 29255
 - Data sheet 30268
 - Data sheet 30272
 - Data sheet 95581
 - Operating instructions 29689-B
 - www.boschrexroth.com/sydfc
 - www.boschrexroth.com/spc

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