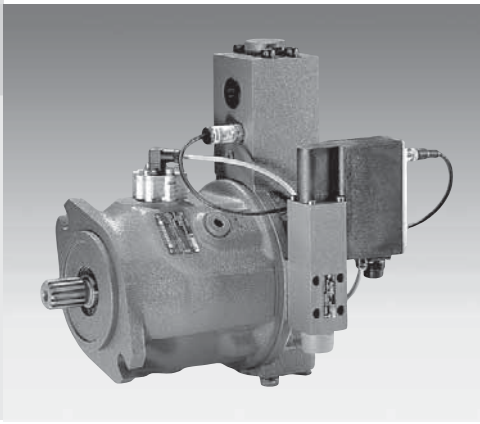
Pressue and flow closed loop system

RA 30030/01.04 **1/**14
Replaces 10.02

Model SYDFEE



Series 2X

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Features

The DFEE control is used for the electro-hydraulic closed loop control of the pressure and swivel angle of an axial piston pump The SYDFEE.. closed loop control system consists of the following components:

- A10VSO axial piston pump with built-on proportional valve as the pilot valve VT-DFPE…-2X/..
- The VT-DFPE..-2X/.. valve with integrated analogue control and closed loop control electronics realises the complete closed loop control function for the DFEE system
- The acquisition of the swivel angle is via a rotary angle sensor type VT-SWA-1-1X which is a hall effect based sensor
- Pump pre-load valve (optional)
- Combination pumps are possible
- HM16 (optional) pressure transducer for fitting into the pump or the pre-load valve with a direct connection to the closed loop control electronics result in a plug-free complete system.

Further information regarding this system:

– Component description, A10VSO	RE 92712 for NS 18, RE 92711 for NS 28 to140
– Component description, VT-SWA-1-1X rotary angle sensor	RE 30268
– Component description, HM 12-1X / HM 13-1X pressure transducer	RE 29933
– Component description, HM16-1X pressure transducer	RE 30266
– Component description, VT-DFPE…-2X/… pilot valve	RE 29016
– Component description, SYDZ 0001-1X pump pre-load valve	RE 29255

Additional information regarding the SYDFEE system can be found in:

– Sales inforamtion (engineering guidelines)	RE 30030-01-V

Ordering details

**SYDFEE – 2X / – P 12 – – A * **

Single pump [1]
Pump combination [2]

Series 20 to 29 **= 2X**
(20 to 29: unchanged installation and connection dimensions)

Pump A10VSO

Nominal Size 18 **= 018**
Nominal Size 28 **= 028**
Nominal Size 45 **= 045**
Nominal Size 71 **= 071**
Nominal Size 100 **= 100**
Nominal Size 140 **= 140**

Direction of rotation
Clockwise (pref. types for through drive pumps) **= R**
Anti-clockwise **= L**

Pressure fluid
Mineral oil to DIN 51 524 (HL/HLP) **= P**

Shaft end
(◢ = Preferred types for through drive pumps)

NS	18	28	45	71	100	140	
[3]	–	Ø22	Ø25	Ø32	Ø40	Ø45	**= P**
[4]	3/4“ ◢	–	–	–	1 1/2“ ◢	1 3/4“ ◢	**= S**
[5]	–	7/8“ ◢	1“ ◢	1 1/4“ ◢	–	–	**= R**

Connection flange (● = available)

NS	18	28	45	71	100	140	
ISO 2-hole	–	●	●	●	●	–	**= A**
ISO 4-hole	–	–	–	–	–	●	**= B**
SAE 2-hole	●	–	–	–	–	–	**= C**

Actuator line connections
Pressure connection B, Suction connection S: SAE, on opposite sides, metric mounting heads **= 12**

Through drive (see table on page 3)
Without through drive **= N00**
Through drive without hub for mounting:
(All built-on pumps are with a SAE splined shaft)

Centre dia.	Pump to be fitted	
Ø82.55 mm (3.25 in.)	A10VSO18	**= KC1** [6]
Ø100 mm (3.94 in.)	A10VSO28/45	**= KD3** [6]
Ø125 mm (4.92 in.)	A10VSO71/100	**= KD5** [6]
Ø180 mm (7.09 in.)	A10VSO140	**= KD7** [6]
Ø101.6 mm (4.00 in.)	Gear pump	**= KC3** [6]
Ø127 mm (5.00 in.)	Gear pump	**= KC5** [6]

With single pumps the hub must be ordered separately.
With combination pumps the hub is included within the scope of supply.

Accessories:
For plug-in connectors (separate order) see page 12

Further details in clear text

Pre-load valve
1 = Pressure limitation 200 bar (2900 PSI)
2 = Pressure limitation 250 bar (3636 PSI)
3 = Pressure limitation 300 bar (4351 PSI)
X = Without pre-load valve

Pressure transducer
C = HM 12 (4 to 20 mA) measuring range up to 315 bar (4568 PSI)
G = HM 13 (0 to 10 V) measuring range up to 315 bar (4568 PSI)
L = HM 16 (0.5 to 5 V) measuring range up to 315 bar (4568 PSI) [7] with connection cable 0.5 m (1.64 ft.) and plug-in connector M12
X = Without pressure transducer

Actual pressure input
C = Current input 4 – 20 mA
V = Voltage input 0 – 10 V
D = Voltage input 0 – 5 V
E = Voltage input 1 – 10 V
F = Voltage input 0.5 – 5 V [8]

Electronic sub-assembly, optional
0 = No option
1 = Without leakage oil compensation

Additional function “power limitation”
A = Without power limitation
B = With power limitation

Valve, mounting orientation, integrated electronics
0 = Radial to the pump axis
2 = 90° in the direction of the connection plate

A = Valve, spool version

Basic pump version
0000 = Remote supply (NS 18 … 100)
0487 = Remote supply (NS 140)

[1] See ordering example at the top of page 3
[2] See ordering example at the top of page 3
[3] Cylinderical with key, DIN 6885
[4] SAE spline profile
[5] SAE spline profile (higher through drive torque)
[6] The through drive is covered by a cover plate
[7] For direct connection to the integrated electronics version “actual pressure input F”
[8] Connection via component socket M12

Ordering details

Ordering example

[1] Ordering example for a single pump
SYDFEE-2X/100R-PSA12N00-0479-A0A0VGX

[2] Ordering example for a combination pump

Both of the type codes are to be connected by a "+." (Material No. of the 1st pump + Material No. of the 2nd pump)

SY2DFEE-2X/100-100/ R900709780 + R900709780
SY2DFEE-2X/100-100/ SYDFEE-2X/100R-PSA12KD5-0000-A0A0CCX + SYDFEE-2X/100R-PSA12KD5-0000-A0A0CCX

- Double pump
- Nom. size of the front pump
- Nom. size of the rear pump
- Material No. of the front pump (or in clear text if the Material No. is not known)
- Material No. of the rear pump (or in clear text if the Material No. is not known)

Preferred types: single pump

Type	Material No.
SYDFEE-2X/018R-PSC12N00-0000-A0A0CCX	**R900708503**
SYDFEE-2X/018R-PSC12N00-0000-A0A0CC2	**R900708504**
SYDFEE-2X/028R-PPA12N00-0000-A0A0CCX	**R900708505**
SYDFEE-2X/028R-PPA12N00-0000-A0A0CC2	**R900708506**
SYDFEE-2X/045R-PPA12N00-0000-A0A0CCX	**R900708507**
SYDFEE-2X/045R-PPA12N00-0000-A0A0CC2	**R900708508**
SYDFEE-2X/071R-PPA12N00-0000-A0A0CCX	**R900708510**
SYDFEE-2X/071R-PPA12N00-0000-A0A0CC2	**R900708511**
SYDFEE-2X/100R-PPA12N00-0000-A0A0CCX	**R900708512**
SYDFEE-2X/100R-PPA12N00-0000-A0A0CC2	**R900708513**
SYDFEE-2X/140R-PPB12N00-0000-A0A0CCX	**R900708514**
SYDFEE-2X/140R-PPB12N00-0000-A0A0CC2	**R900708515**

Preferred types: through drive pumps for combination pumps

Type	Material No.
SYDFEE-2X/028R-PRA12KD3-0000-A0A0CCX	**R900709773**
SYDFEE-2X/045R-PRA12KD3-0000-A0A0CCX	**R900709774**
SYDFEE-2X/071R-PRA12KD5-0000-A0A0CCX	**R900709775**
SYDFEE-2X/100R-PSA12KD5-0000-A0A0CCX	**R900709780**
SYDFEE-2X/140R-PSB12KD7-0000-A0A0CCX	**R900709781**

			Nominal size						
Through drive (● = available)			**18**	**28**	**45**	**71**	**100**	**140**	
Without through drive			●	●	●	●	●	●	**N00**
With through drive for mounting an axial piston pump, a gear pump or radial piston pump									
Mounting flange	Shaft/coupling (separate order)	For fitting a:							
ISO 100, 2-hole	Splined shaft 7/8" 22-4 (SAE B)	A10VSO 28 (shaft S or R)	–	●	●	●	●	●	**KD3**
ISO 100, 2-hole	Splined shaft 1" 25-4 (SAE B-B)	A10VSO 45 (shaft S or R)	–	–	●	●	●	●	**KD3**
ISO 125, 2-hole	Splined shaft 1 1/4" 32-4 (SAE C)	A10VSO 71 (shaft S or R)	–	–	–	●	●	●	**KD5**
ISO 125, 2-hole	Splined shaft 1 1/2" 38-4 (SAE C-C)	A10VSO 100 (shaft S)	–	–	–	–	●	●	**KD5**
ISO 180, 4-hole	Splined shaft 1 3/4" 44-4 (SAE D)	A10VSO 140 (shaft S)	–	–	–	–	–	●	**KD7**
82-2 (SAE A, 2-hole)	Splined shaft 5/8" 16-4 (SAE A)	1PF2G2, PGF2	●	●	●	●	●	●	**KC1**
82-2 (SAE A, 2-hole)	Splined shaft 3/4" 19-4 (SAE A-B)	A10VSO 10, 18 (shaft S)	●	●	●	●	●	●	**KC1**
101-2 (SAE B)	Splined shaft 3/8" 22-4 (SAE B)	A10VO 28 (shaft S), PGF3	–	●	●	●	●	●	**KC3**
101-2 (SAE B)	Splined shaft 1" 25-4 (SAE B-B)	A10VO 45 (shaft S), PGH4	–	●	●	●	●	●	**KC3**
127-2 (SAE C)	Splined shaft 1 1/4" 32-4 (SAE C)	A10VO 71 (shaft S)	–	–	–	●	●	●	**KC5**
127-2 (SAE C)	Splined shaft 1 1/2" 38-4 (SAE C-C)	A10VO 100 (shaft S), PGH5	–	–	–	–	●	●	**KC5**
152-4 (SAE D)	Splined shaft 1 3/4" 44-4 (SAE D)	A10VO 140 (shaft S)	–	–	–	–	–	●	**KC6**

Function, section

The closed loop control of pressure and swivel angle of the A10VSO SYDFEE system variable displacement pumps is via an electrically controlled proportional valve (2). The proportional valve determines the position of the swashplate (1) via the control piston (4). The displaced flow is proportional to the position of the swashplate. The control spool (3), which is pre-loaded by a spring (5), is permanently subjected to the pump pressure.

With a non-rotating pump and the control system at zero pressure, the swashplate is held in position + 100 % by the spring (5). With a driven pump and a de-energised proportional solenoid (8) the system regulates to zero stroke pressure as the valve spool (9) is pushed to the initial position by the spring (10) and, therefore the pump pressure p is applied to the control piston (4) via valve port A. A balance between the pump pressure at the control piston and the spring force (5) is achieved between 8 to 12 bar (116 to 174 PSI). This basic setting is obtained with e.g. de-energised valve electronics (= zero stroke operations).

The control of the proportional valve is taken over by the analogue electronicis (11) which are integrated into the valve. The closed loop control electronics processes all of the control signals required to operate the A10VSO variable displacement pump in the closed loop pressure and flow mode.

The closed loop control electronics has separate command value inputs for the pressure and swivel angle via the central plug (12); For the optional power limitation, the command value is adjusted via an internal potentiometer. The HM16 pressure transducer is connected to connection P of the pump or when the SYDZ pre-load valve is fitted to connection MP1 and to the M12 component socket (13). Alternatively an external pressure transducer can be connected via the central plug (12). A position transducer with integrated electronics (7) fitted on the pump determines the swivel angle actual value. The actual value is processed in the amplifier and compared with the given command value. The minimum value generator ensures, automatically, that only the allocated controller is active at the required working point. Thereby, a system value (pressure, swivel angle or [optional] power) is exactly controlled, the other two values lie under the stated command values. The output signal of the minimum value generator becomes the command value for the valve control circuit.

The actual value for the valve spool position is sensed using an inductive position transducer (6). The output value of the valve position controller defines, via the amplifier output stage, the current through the proportional solenoids (8). As soon as the working point is reached the proportional valve control spool (9) is switched to the mid position.

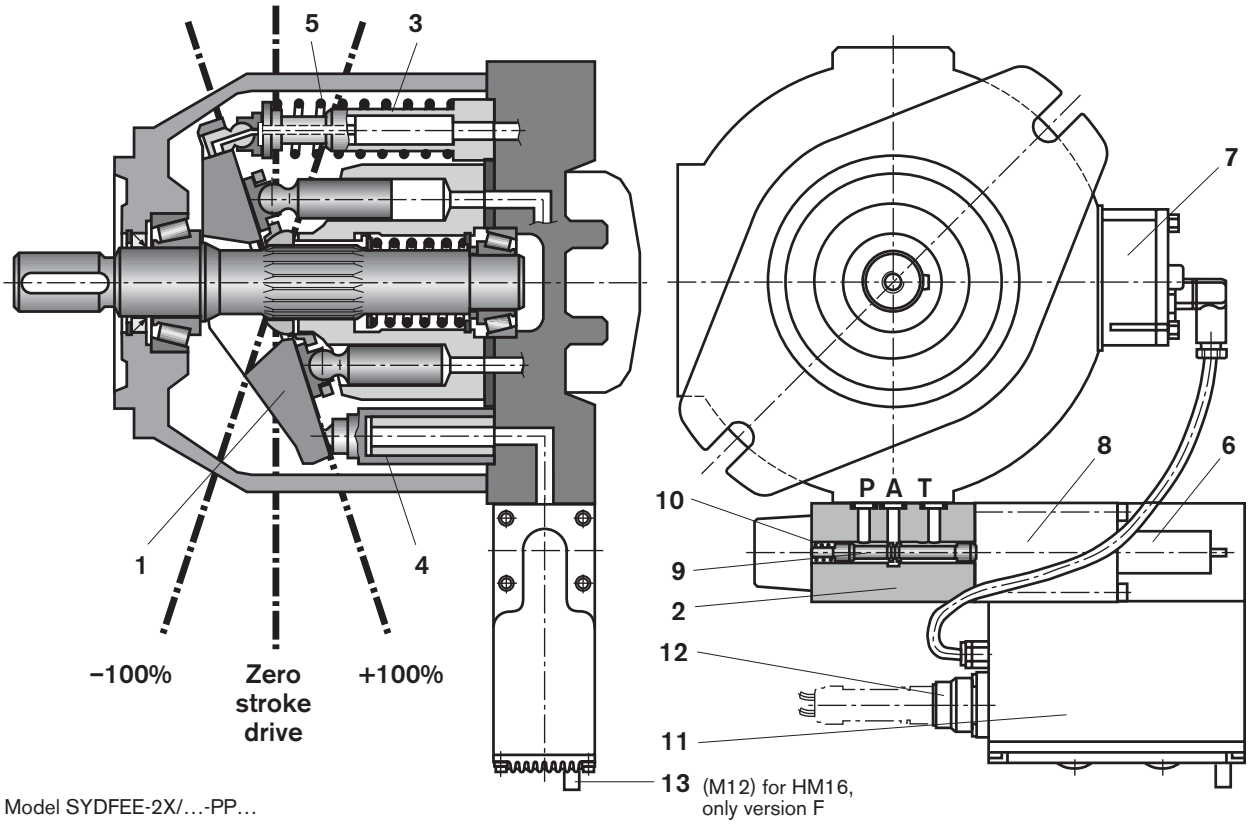
If the higher-level controllers demand an increase of the swivel angle (increase in flow), then the valve spool (9) must be moved from the mid position (connection of the control piston (4) via valve port A → T) until the swivel angle has reached the required value. The movement of the valve spool against the force of the spring (10) is achieved by accordingly increasing the electrical current through the proportional solenoid (8).

The reduction of the swivel angle (reduction in flow) is achieved by connecting the control piston (4) from P → A.

Control system supply

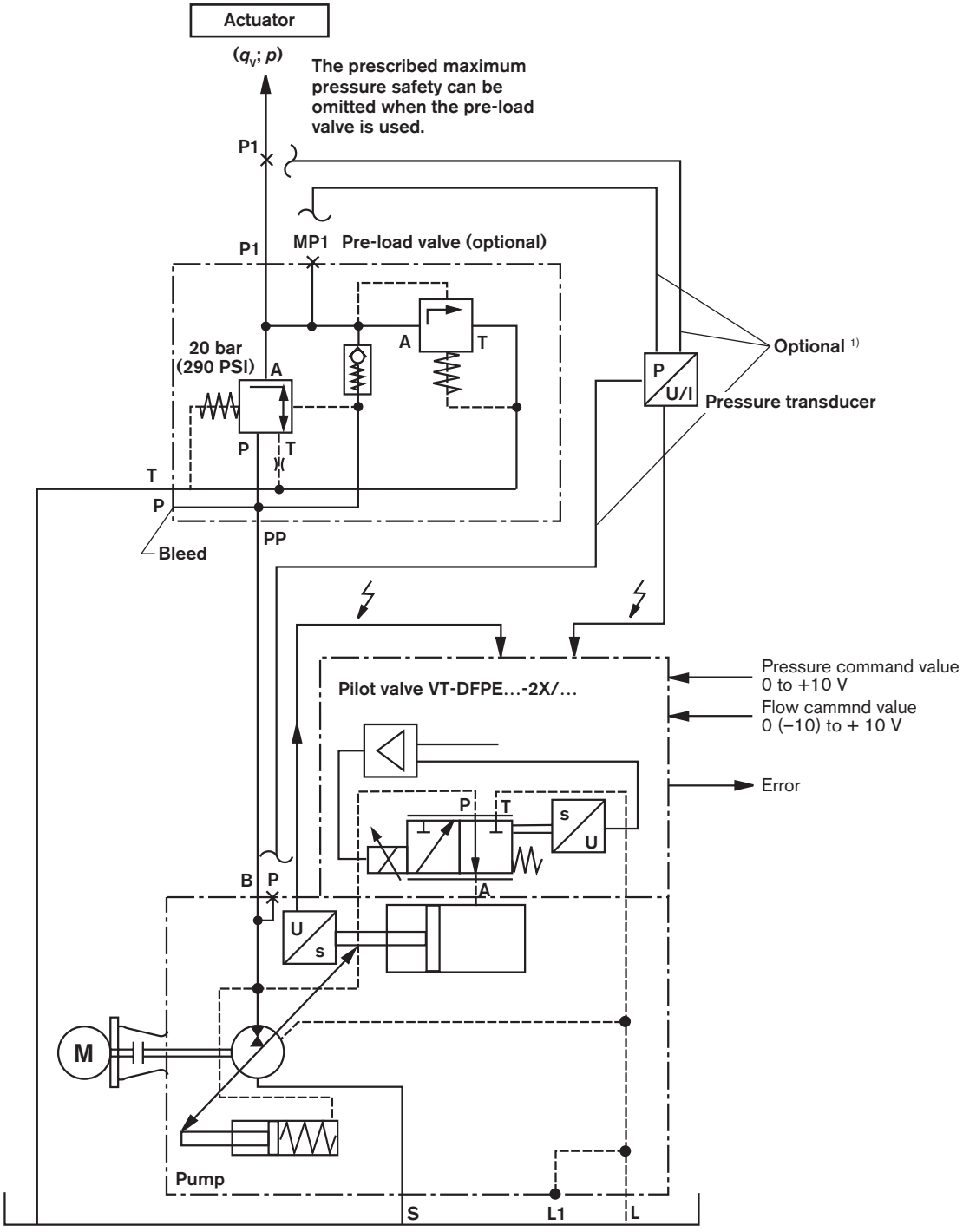
There are three ways of supplying the pump's hydraulic control system with pilot oil:

1. Internal, without pre-load valve (only possible for system pressures > 20 bar [290 PSI])
2. Internal, with pre-load valve (system pressure 0 … 100%)
3. Remote supply via a shuttle valve – automatic switchover internal / external via a shuttle valve sandwich plate (take the sales information stated within RE 30030-01-V into account!)



Model SYDFEE-2X/…-PP…

Operating principle: with internal supply for the control system (inlet supply)

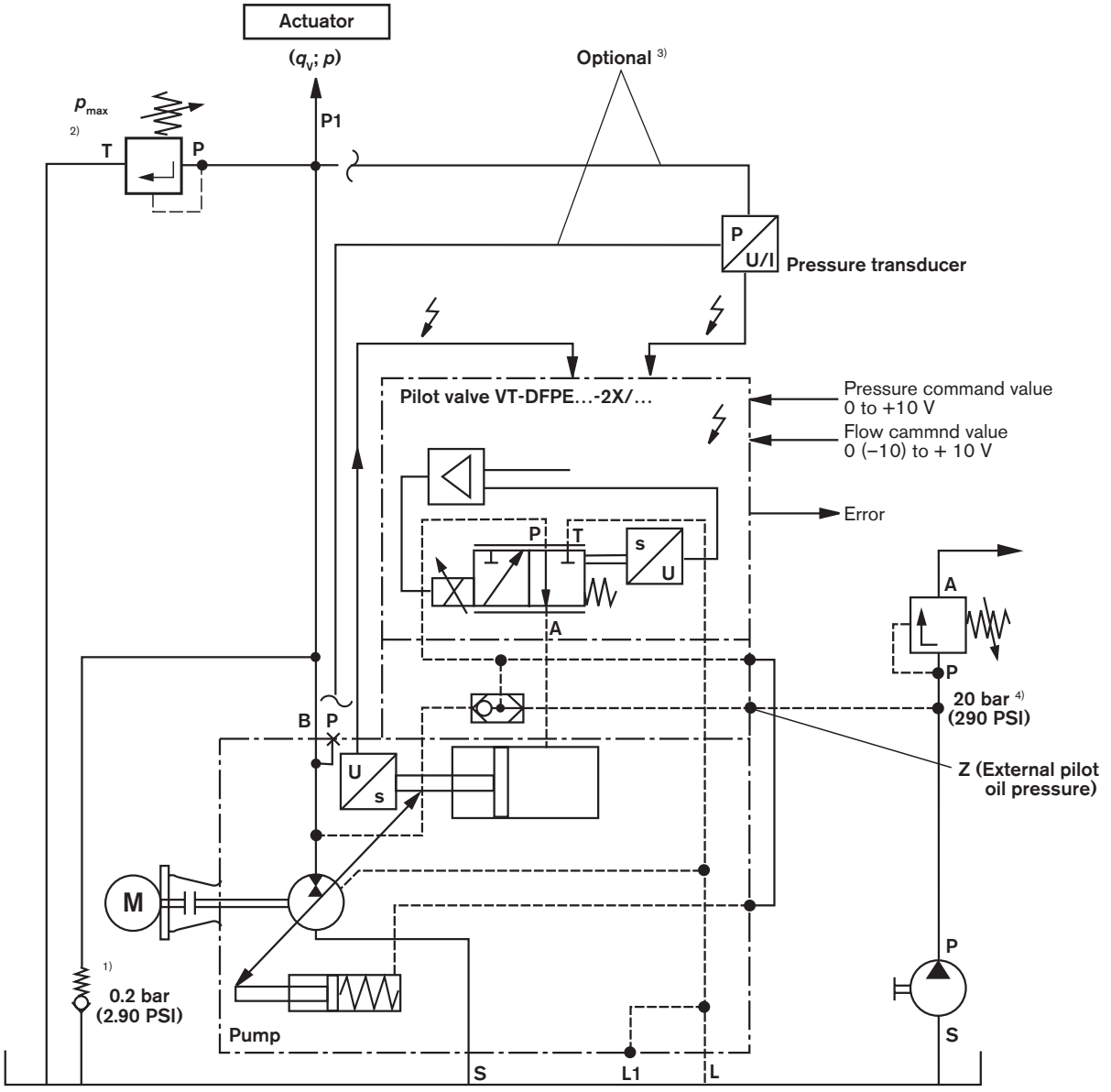


1)

Pressure transducer	Mounting possibilities		Notes
	With SYDZ 2)	Without SYDZ 2)	
HM16	MP1	P	Only in conjunction with the electronic version “actual pressure input F”
HM12 / HM13	P1	P1	Preferably in the vicinity of the actuator

2) Pump pre-load valve

Operating principle: remote supply for the control system



1) The anti-cavitation valve must be fitted (a check valve with 0.2 bar [2.9 PSI] spring), to prevent cavitation in the case of a fault.

2) The maximum pressure safety is the responsibility of the customer!

3)

Pressure transducer	Mounting possibilities	Notes
HM16	P	Only in conjunction with the electronic version “actual pressure input F”
HM12 / HM13	P1	Preferably in the vicinity of the actuator

4) The upper limit for the external pilot oil supply pressure has to be taken into account! (compare RE 30030-01-V), recommendation: 20 bar (290 PSI) absolute.

⚠ Attention!

- With the remote supply of the control system the feature where the pump swivels to the zero stroke position when the control electronics are de-enegised is deactivated.
- With de-enegised control electronics the control pumps swashplate is pushed onto the negative stop via the remote pressure (100 % of the flow is passed to tank).
- When a fault is determined the output stage is not switched off. With an active fault signal the machine control must react (e.g. switch off the pump, drive motor, interrupt the remote pressure source).
- Command values for pressure and flow must be greater than zero ($p_{com.I} \geq 3$ bar [43.5 PSI], $\alpha_{com.} \geq 5$ %), as due to drift or inacurate setting no exact pressure “zero” or swivel angle “zero” exists. Smaller command values can inunfavourable conditions lead to cavitation.
- The pressure actual value must not be longer than 10 bar (145 PSI) for more than 10 minutes (lubrication).

Technical data (for applications outside these paramters, please consult us!)

General

Drive RPM		n	**See RE 92711 (NS 28 – 140) and RE 92712 (NS 18)**					
Nominal size		NS	18	28	45	71	100	140
Weight	– Pump without through drive incl. control valve	kg (lbs.)	14 (30.9)	17 (37.5)	23 (50.7)	35 (77.1)	47 (103.6)	62 (136.6)
	– Additional, pre-load valve	kg (lbs.)	3.3 (7.3)	3.3 (7.3)	3.3 (7.3)	6.3 (13.9)	6.3 (13.9)	6.3 (13.9)
	– Additional, with external control system supply	kg (lbs.)	2 (4.4)	2 (4.4)	2 (4.4)	2 (4.4)	2 (4.4)	2 (4.4)

Hydraulic

Maximum permissible operating pressure p_{max}	bar (PSI)	250 (3625) [1] [280 (4060) after consultation]
Adjustment pressure p_{min}	bar (PSI)	≥ 20 (290)
p_{max} with external pilot oil supply	bar (PSI)	≤ 30 (435)
Pressure fluid temperature range	°C (°F)	–20 to +70 (–4 to +158)
Pressure fluid		Mineral oil (HL, HLP) to DIN 51 524
Degree of contamination		Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 7 or 18/16/13 to ISO 4406 (for particle sizes 2/5/15 µm)

Electrical

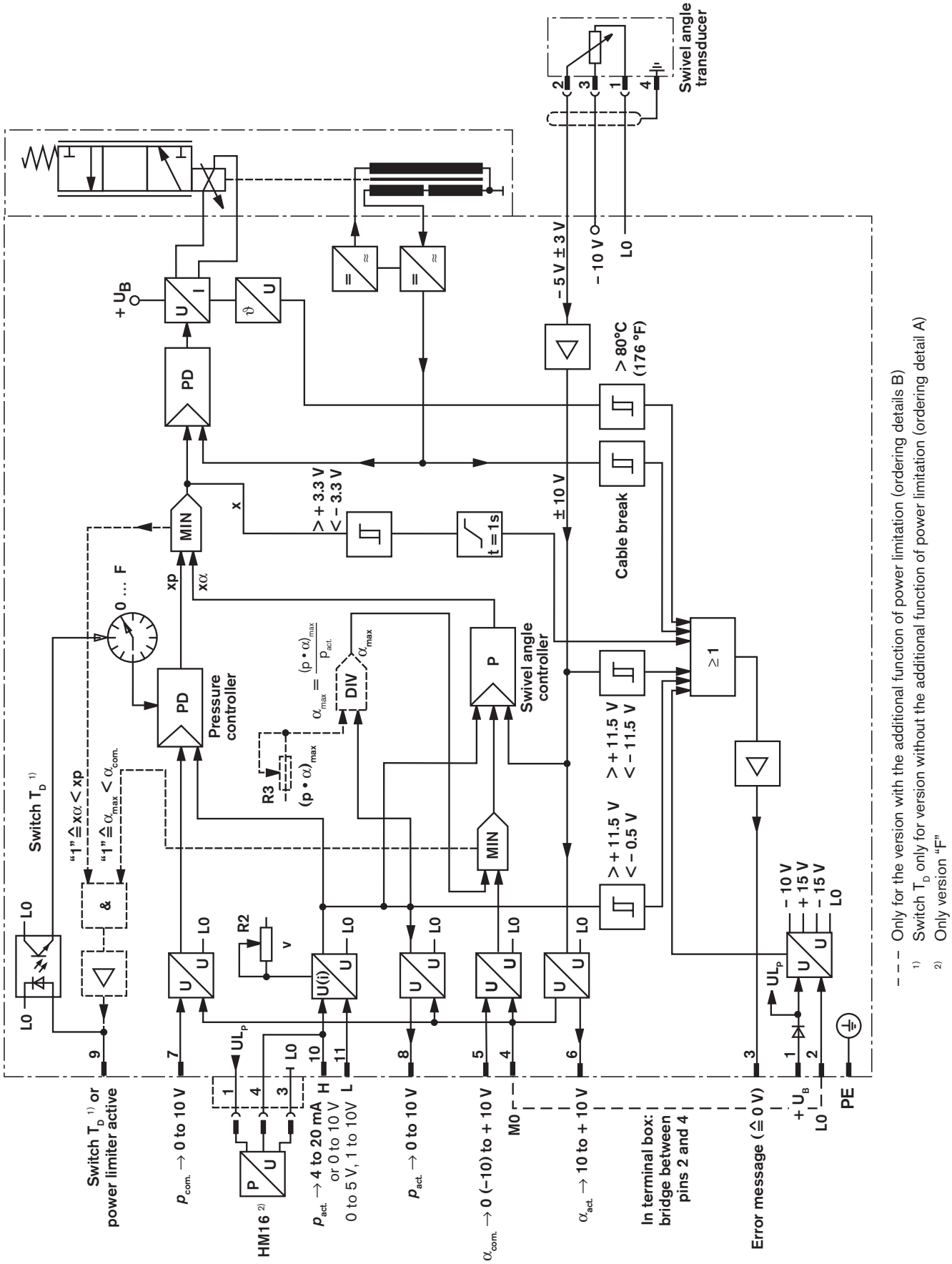
Operating voltage		U_B	24 VDC + 40 % – 5 %
Operating range			
	– Upper limiting value	$u_B(t)_{max}$	35 V
	– Lower limiting value	$u_B(t)_{min}$	21 V
Power requirements (in static closed loop control operation)			
	– Nominal current	$I_{Nom.}$	0.6 A
	– Maximum current	I_{max}	1.25 A
Inputs	– Command values (pressure and swivel angle)	U_e	0 to 10 V; RE = 100 kΩ
	– Switch T_D (only with ordering detail **A** w/o additional functions)		
	• "Off"	U_e	< 0.6 V
	• "On"	U_e	> 21 V
	– Actual pressure valve (depending on the actual pressure input, see ordering code)		
	• Current input (ordering detail **C**)	R_B	100 Ω
	• Voltage input (ordering details **V**, **D**, **E**, **F**)	R_E	100 kΩ
Outputs	– Actual values		
	• Pressure	U_a	0 to 10 V/1.5 mA
	• Swivel angle	U_a	± 10 V/1.5 mA
	– Fault message → L active	U_a	≥ U_B – 5 V; 10 mA (short-circuit proof); error: U_a < 1 V
	– Power limitation → H active (only with ordering detail **B** with additional function)	U_a	≥ U_B – 5 V; 10 mA (short-circuit proof); inactive: U_a < 1 V
Electrical connection			Plug-in connector 12-pin, N11REFF, DIN 43 563 [2]
Permissible ambient temperature range		°C (°F)	0 to +60 (+32 to +140)
Storage temperature range		°C (°F)	0 to +70 (+32 to +158)
Protection to DIN 40 050			IP 65 with integrated and fixed plug-in connector

[1] For supplements see the sales information (engineering guidelines) RE 30030-01-V

[2] Separate order, see page 12 (electrical connections)

☞ **Note:** For details regarding the **environmental simulation test** covering EMC (electro-magnetic compatibilty), climate and mechanical loading see RE 30030-U (declaration regarding environmental compatatility).

Block circuit diagram/pin allocation of the integrated electronics for SYDFEE (model VT-DFPE-2X)



– – – Only for the version with the additional function of power limitation (ordering details B)

1) Switch T_D only for version without the additional function of power limitation (ordering detail A)

2) Only version "F"

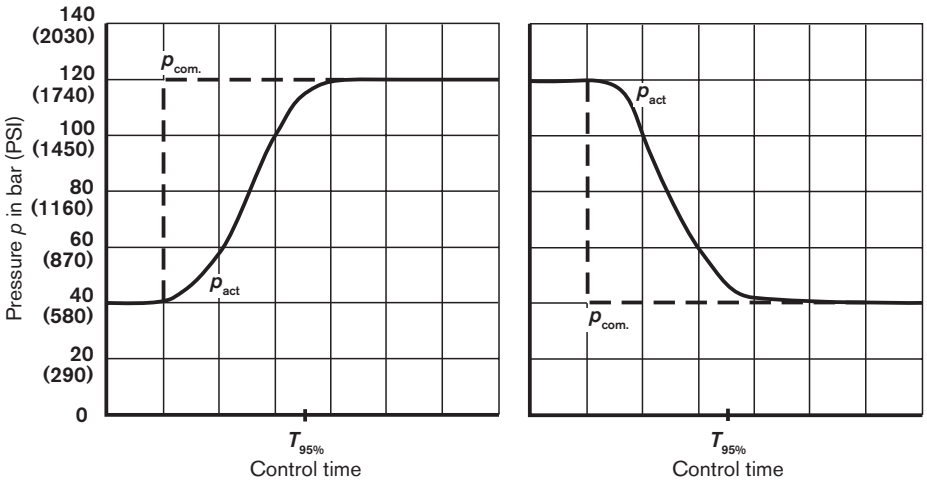
Control loop control accuracy SYDFEE
(the stated values are only valid when the system applicable components, as per the type code, are used!)

	Closed loop swivel angle control	Closed loop pressure control [1]
Linearity tolerance	≤ 1.0 %	≤ 1.5 %
Temperature drift	≤ 0.5 %/10 K	≤ 0.5 %/10 K
Hysteresis	≤ 0.2 %	≤ 0.2 %
Repeatability	≤ 0.2 %	≤ 0.2 %

[1] Without taking the pump pulsation into account

Transient function with a pressure command value jump SYDFEE with a 360° spool (version "A")

The stated curve forms and control times can only be achieved by optimising the pressure controller.



$T_{95\%}$ in ms with an attached pressure fluid volume (pipes and actuator)

< 5 L (1.3 G)	150 ms
5 – 10 L (1.3 – 2.6 G)	200 ms
15 – 25 L (4.0 – 6.6 G)	250 ms

For pressures up to 40 bar (580 PSI) the response time values are higher.

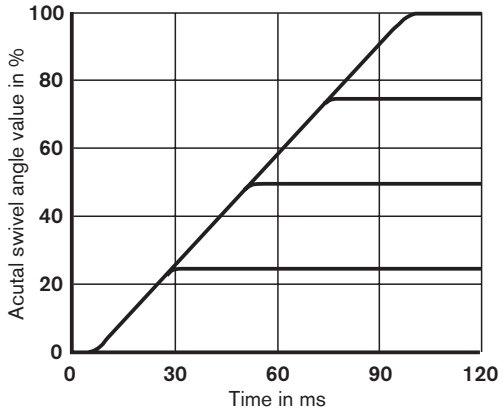
Optimizing the pressure controller for the SYDFEE (setting the jumpers)

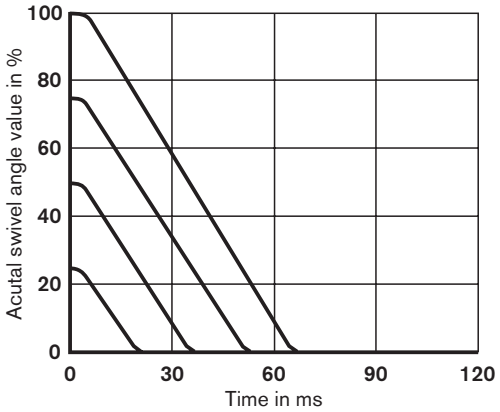
Switch position		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
[2]	T_D OFF	≤ 5 (1.32)	6.25 (1.65)	7.5 (1.98)	10 (2.64)	12.5 (3.30)	15 3.96)	20 (5.28)	25 (6.60)	≤ 5 (1.32)	6.25 (1.65)	7.5 (1.98)	10 (2.64)	12.5 (3.30)	15 3.96)	20 (5.28)	25 (6.60)
	T_D ON	7.5 (1.98)	10 (2.64)	12.5 (3.30)	15 3.96)	20 (5.28)	25 (6.60)	30 (7.93)	35 (9.25)	12.5 (3.30)	15 3.96)	20 (5.28)	25 (6.60)	30 (7.93)	35 (9.25)	40 (10.6)	45 (11.9)

[2] The fluid volume of the connected pipes and actuators (in Liters [Gallons])

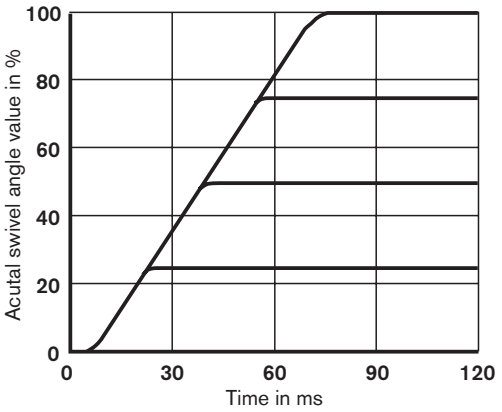
Transient functions with swivel angle command value jump with a 360° spool (version “A”)

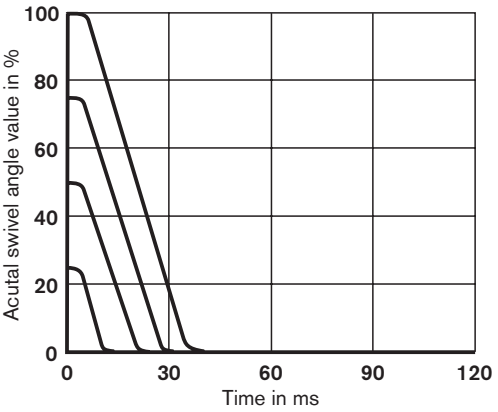
NS 18, 28, 45, 71 p = 20 bar (290 PSI)



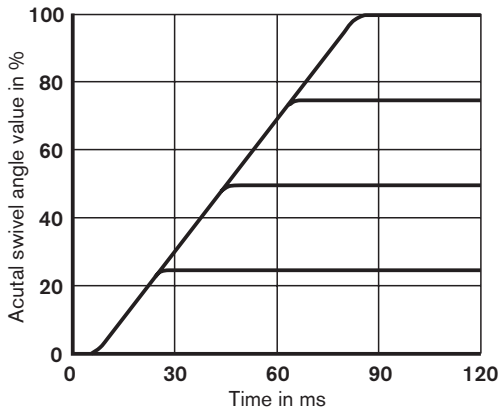


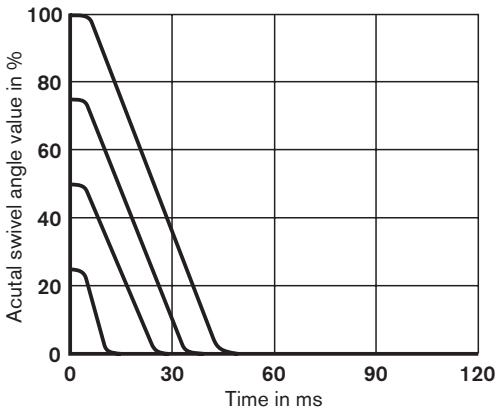
NS 18, 28, 45, 71 p = 50 bar (725 PSI)



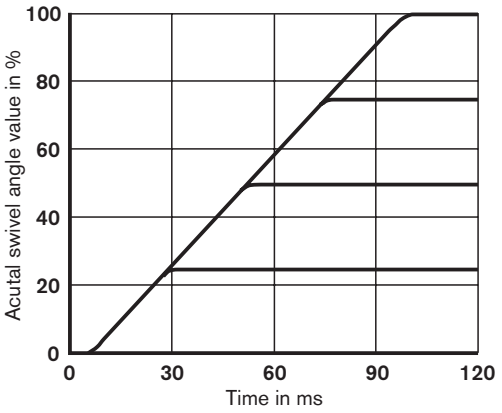


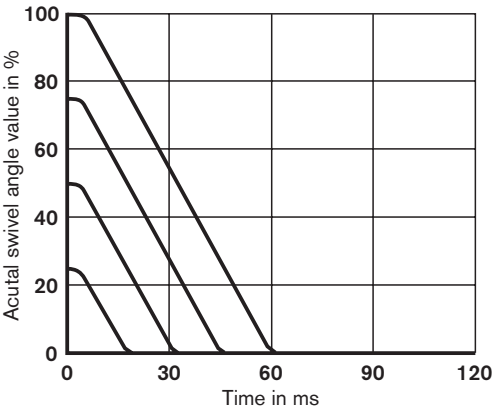
NS 100 p = 50 bar (725 PSI)





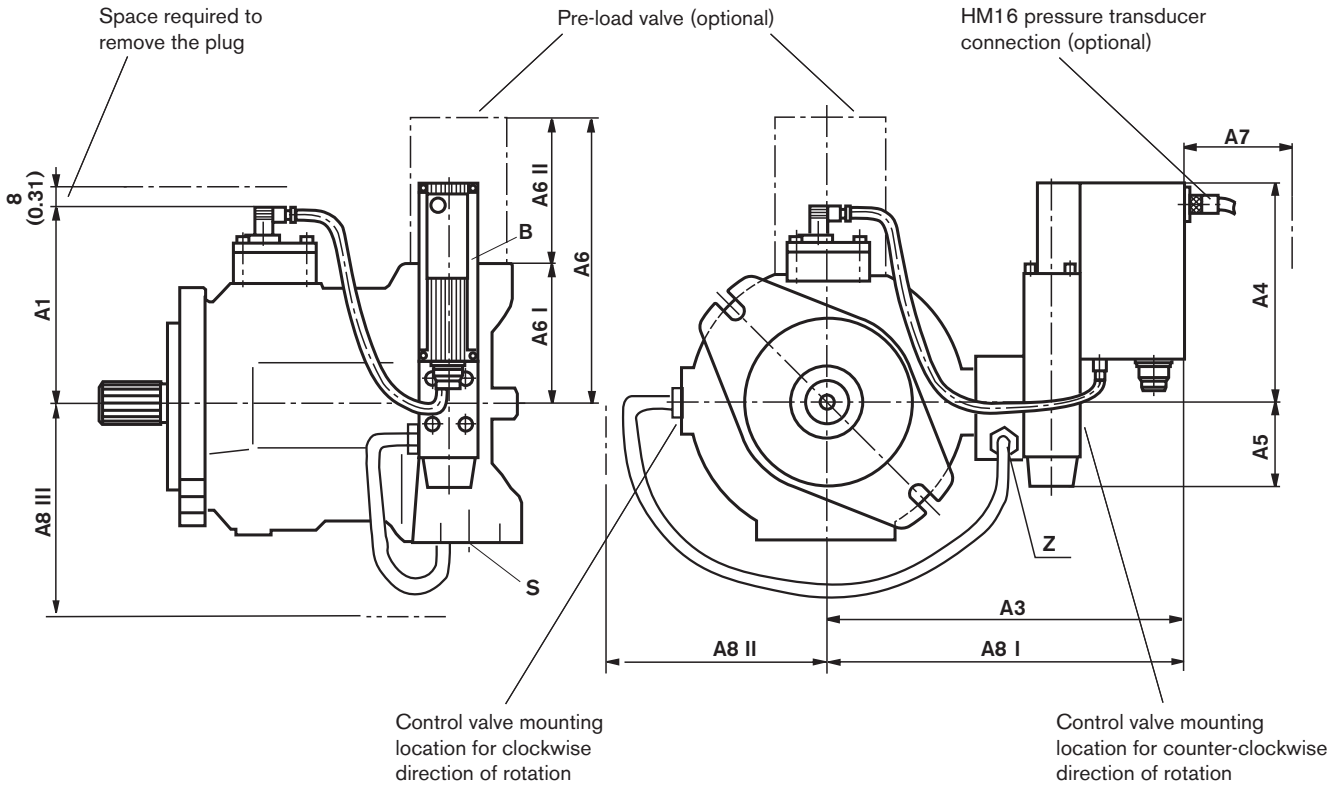
NS 140 p = 50 bar (725 PSI)





Unit dimensions SYDFEE – dimensions in millimeters (inches)

Nominal sizes 18 to 140
(valve assembly orientation “0”; shaft type “S”; without through drive “N00”)



NS	A1	A3	A4	A5	A6	A6 I	A6 II	A7	Pilot oil connection “Z“		
									A8 I	A8 II	A8 III
18	120 (4.72)	198 (7.80)	158 (6.22)	63 (2.48)	178 (7.01)	63 (2.48)	115 (4.53)	60 (2.36)	233 (9.17)	125 (4.92)	100 (3.94)
28	128 (5.04)	208 (8.19)	158 (6.22)	63 (2.48)	195 (7.68)	80 (3.15)	115 (4.53)	60 (2.36)	243 (9.57)	135 (5.32)	115 (4.53)
45	134 (5.28)	218 (8.58)	158 (6.22)	63 (2.48)	205 (8.07)	90 (3.54)	115 (4.53)	60 (2.36)	253 (9.96)	145 (5.71)	125 (4.92)
71	146 (5.75)	232 (9.13)	158 (6.22)	63 (2.48)	254 (10.00)	104 (4.09)	150 (5.91)	60 (2.36)	267 (10.51)	159 (6.26)	150 (5.91)
100	151 (5.94)	237 (9.33)	158 (6.22)	63 (2.48)	247 (9.72)	100 (3.94)	147 (5.79)	60 (2.36)	272 (10.71)	164 (6.47)	150 (5.91)
140	162 (6.38)	250 (9.84)	143 (5.63)	78 (3.07)	257 (10.12)	110 (4.33)	147 (5.79)	60 (2.36)	285 (11.22)	182 (7.17)	150 (5.91)

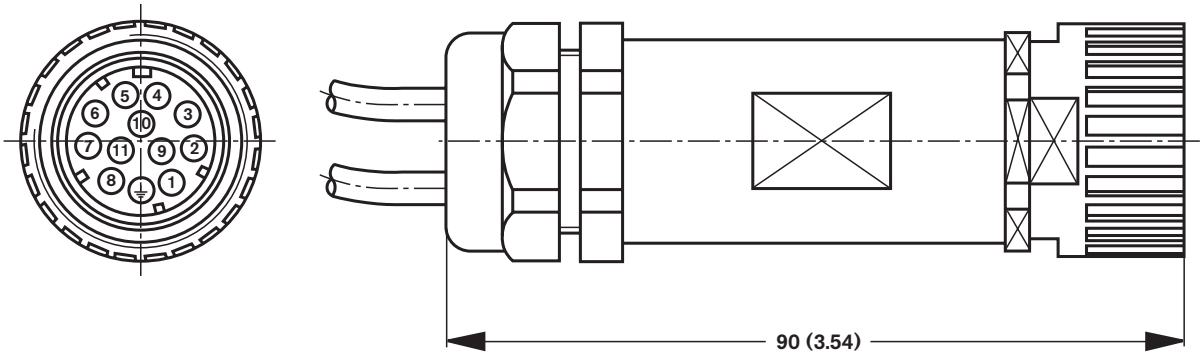
Dimension A7 → required installation room for the optional connection of the HM16 pressure transducer

Electrical connections

Central connection

Plug-in connector to E DIN 43 563-B (12-pin), separate order: X:

- Plug-in connector without cable (assembly kit) Material No. **R900884671**
- Plug-in connector with cable set 2 x 5 m (16 ft.) Material No. **R900032356**
- Plug-in connector with cable set 2 x 20 m (66 ft.) Material No. **R900860399**



Allocation of the component plug or plug-in connector and cable set

For type SYDFEE… **C**
V/.V
D
E

Pin	Allocation	Code	
1	+ UB	1	Supply cable 3 x 1.0 mm² (0.0016 in²)
2	0 V ≙ L0	2	
PE	Earth	Green/yellow	
3	Fault	White	Signal cable 10 x 0.14 mm² (0.0002 in²); Screened (The screen must be attached at one end to the control!)
4	M0	Yellow	
5	$\alpha_{com.}$	Green	
6	$\alpha_{act.}$	Violet	
7	$p_{com.}$	Pink	
8	$p_{act.}$	Red	
9 [1]	Switch T_D or power limitation	Brown	
10	Pressure actual value H	Black	
11	Pressure actual value L	Blue	
n.c.		Gray	

For type SYDFEE…**F**/.V

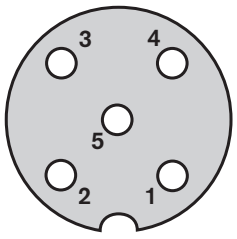
Pin	Allocation	Code	
1	+ UB	1	Supply cable 3 x 1.0 mm² (0.0016 in²)
2	0 V ≙ L0	2	
PE	Earth	Green/yellow	
3	Earth	White	Signal cable 10 x 0.14 mm² (0.0002 in²); Screened (The screen must be attached at one end to the control!)
4	M0	Yellow	
5	$\alpha_{com.}$	Green	
6	$\alpha_{act.}$	Violet	
7	$p_{com.}$	Pink	
8	$p_{act.}$	Red	
9 [1]	Switch T_D or power limitation	Brown	
10	Reserved	Black	
11	Reserved	Blue	
n.c.		Gray	

[1] – Version **without** power limitation (**A**): Switched **input** "Switch T_D"
– Version **with** power limitation (**B**): Switched **output** "power limitation active"

HM 16 pressure transducer connections (unit socket M12x1)

Pin	Allocation
1	+ U_B
3	Ref.
4	Signal

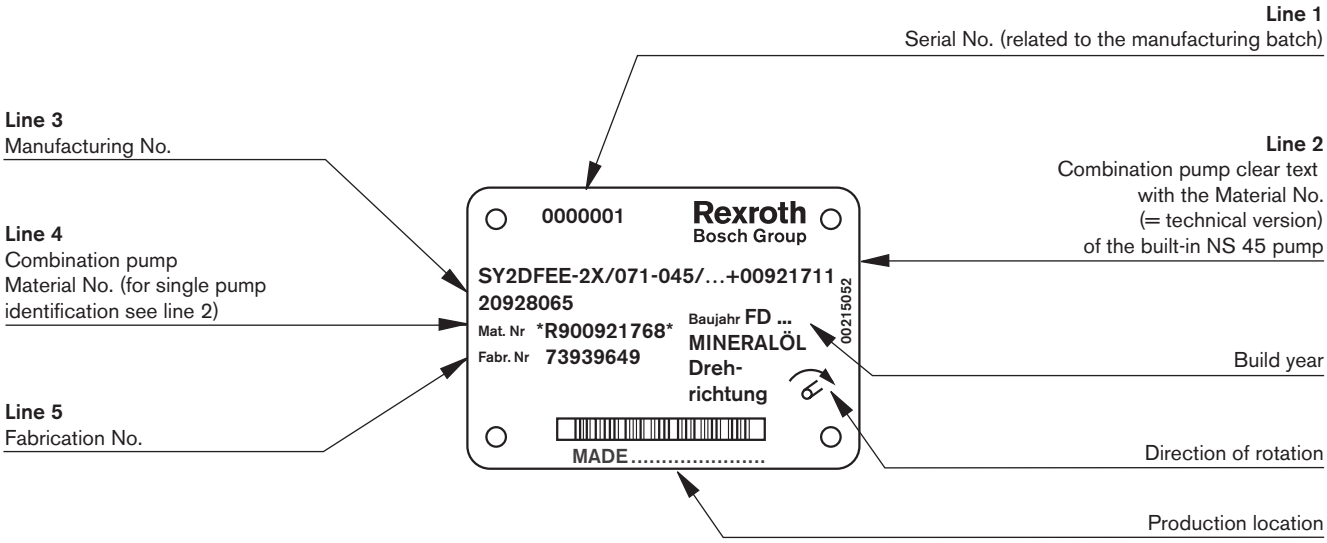
View on the unit socket



Matching connection plug for the actual pressure value input for version F: Plug-in connector type M12x1 (screened version)

Name plate example for a SY2DFEE combination pump

Shown is the name plate of the built-on NS 45 pump!



☞ **For the answers to any questions regarding the combination pump the Material No. (line 4) and the Fabrication No. (line 5) are required.**

Engineering guidelines

- Command values must only be switched via relays having gold contacts (small voltages, small currents)
- Always screen the command and actual value cables
- The distance to aerial lines or radio sources must be at least 1 m (3.28 ft.)
- Do not lay signal cables near power cables
- Supplementary guidelines regarding the SYDFEE closed loop control system can be found in RE 30030-01-V

Notes

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