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Sauer-Danfoss product overview

CONSTRUCTION

ROAD BUILDING

AGRICULTURE

SPECIALTY

MATERIAL HANDLING

TURF CARE

SAUER DANFOSS

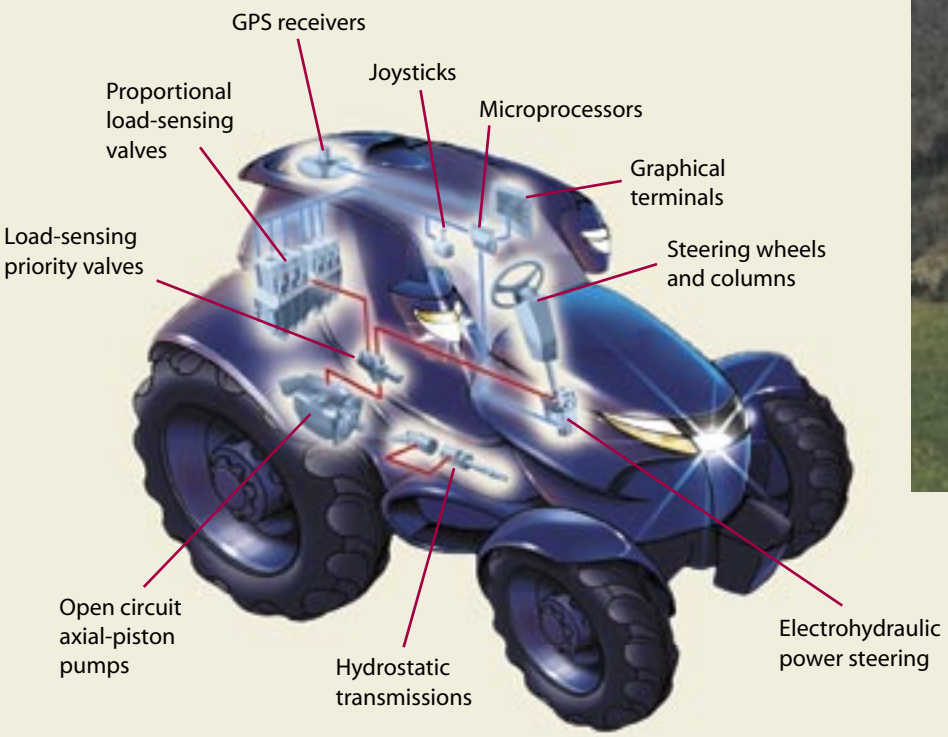
What really matters is inside®

Components and integrated systems for the mobile world

Sauer-Danfoss is a comprehensive supplier of mobile system solutions. With employees, factories, and sales and service support throughout the world, Sauer-Danfoss is among the largest manufacturers and suppliers of mobile power and control systems in the world today. We supply markets around the world with our hydrostatic transmissions, open circuit products, orbital motors, valves, hydrostatic steering systems, AC/DC motors, and mobile electronic controls, as either components or integrated systems.

Sauer-Danfoss products are used on a wide range of mobile equipment in agriculture, construction, material handling, road building, and turf care, as well as specialty vehicles in forestry and on-highway environments.

Drawing on our 45 years of experience, our dedicated and knowledgeable staff offers our customers optimum solutions for their needs, and develops new products and solutions in close cooperation and partnership with them.



Hydrostatics and mechanical gearboxes

Sauer-Danfoss offers transmission solutions for off-highway vehicles, both at component and system levels. Our product range makes it possible to cover low, medium, and high powered applications with single and dual path propulsion drives as well as closed loop auxiliary transmissions.

Hydrostatic transmission solutions
For low and medium powered vehicles such as aerial lifts, skid steer loaders, rollers, mowers, and industrial forklift trucks, and for high powered vehicles like combines, crawlers, forestry machinery, and rollers, Sauer-Danfoss offers the right hydrostatic transmission solutions.

Features and benefits:
- Advanced technology
- Pumps and motors for closed circuit applications
- Controls for every application
- Compact and light weight
- Integral loop flushing valve option for motors
- System packages
- Proven reliability and performance
- Worldwide sales and service
- Variety of filtration options for pumps
- Extensive field experience

Transmission packages for low power vehicles (Series 15 and 70)
- 3 displacements
- U-style and inline packages, or separate variable pumps and fixed motors
- Maximum pressures to 145 bar [2100 psi] (Series 15) and 310 bar [4496 psi] (Series 70)

Axial piston variable displacement single and tandem pumps (Series 40 and 42)
- 7 different displacements
- Complete family of control systems
- Through drives for auxiliary pumps
- Pressures up to 350 and 415 bar, respectively [5076 and 6019 psi]

Axial piston fixed and variable displacement motors (Series 40)
- 4 different displacements
- Compact design
- Short installed length
- Pressures up to 350 bar [5076 psi]

Axial piston two-position motors (L&K)
- 5 displacements in one compact package
- SAE-B and cartridge mounts
- Short installed length

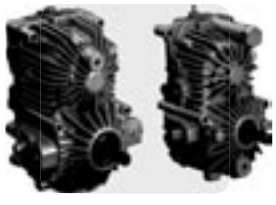
Variable motor with 3.4:1 working displacement ratio
- Overcenter (-2°) capability

Axial piston variable displacement pumps (Series 90)
- Highest through-drive capability
- High power
- The most technically advanced units in the industry
- 7 different displacements
- Complete family of control systems
  – manual displacement controls (MDC)
  – electrical displacement controls (EDC)
  – hydraulic displacement controls (HDC)
  – electrical automotive controls (NFPE)
- Compact and light weight
- Pressures up to 480 bar [6962 psi]

Axial piston fixed and variable displacement motors (Series 90)
- Cartridge motors designed for direct installation in compact planetary drives
- 5 sizes of fixed displacement motors in SAE flange configuration
- Variable displacement motor in SAE or cartridge configuration
- Short installed length
- Pressures up to 480 bar [6962 psi]

SERIES 42

L&K FRAME
VARIABLE MOTORS



U-STYLE
TRANSMISSION
BDU

SERIES 40
M46

SERIES 40
DDC

Bent axis variable displacement motors (Series 51 and 51-1)
- Advanced technology
- 5 sizes in SAE flange configurations, 60 cm³/rev [3.7 in³/rev] to 250 cm³/rev [15.25 in³/rev]
- DIN ISO and cartridge flanges available
- Cartridge motors designed for direct installation in compact planetary drives
- Large displacement ratio (5:1)
- Pressure compensated, two-position, and proportional controls
- Compact and light weight
- Speeds to 7000 min^{-1}(rpm)
- Pressures up to 480 bar [6962 psi]

Compact drives (Series CW&CR)
- Complete family of 2 compact roller drives, and 2 compact wheel drives
- 6 hydrostatic motor frame sizes
- Optimized performance by modular design
- Designed for shortest installed package
- Parking brakes with full input torque capability
- Series planetary gearing for high efficiency
- Separate oil systems for planetary gearbox and hydrostatic motor

Integrated Pump Systems (IPS)
- Simplified hydraulic circuit
- Lower power loss
- Low noise
- Available with SAE mounting flange
- Flexible drive coupling
- Short installation length
- NFPE transmission control
- Integrated auxiliary pump – cast iron gear pump, 44 cm³/rev [2.7in³/rev]
- Temperature control
- Pressures to 480 bar [6962 psi] for closed circuit 75 cm³/rev [4.6 in³/rev]
- Pressures to 260 bar [3771 psi] for open circuit 44 cm³/rev [2.7 in³/rev]

Transit Mixer Gearbox (TMG)
- High output torque
- High power density
- Drum swivel angle +/- 7°
- Splash lubrication
- Separate oil systems
- Low weight

Transit Mixer Pump and Motor (TMP/TMM)
- Proven rotating group
- Electric pump displacement control
- Significant noise reduction
- Significant reduction of envelope size
- Pressures up to 420 bar [6090 psi]

TMP

TMM

SERIES 90

TMG

SERIES 51
AND 51-1

SERIES CR

INTEGRATED
PUMP SYSTEM

Technical data

Hydrostatics and mechanical gearboxes

Technical data Series 70					
		U-style transmission packages			Variable pumps
	Dimension	BDU-10S	BDU-10L	BDU-21L	BDP-10L
Displacement	cm^3 [in^3]	10 [0.61]	10 [0.61]	21 [1.28]	10 [0.61]
Input speed, minimum (pump)	min^{-1}(rpm)	1800	1800	1800	1800
Input speed, maximum (high idle)	min^{-1}(rpm)	3000	3600	3600	3600
Input speed, maximum (loaded)	min^{-1}(rpm)	3000	3600	3200	3600

Technical data Series 15						
		Transmission packages		Variable pumps	Tandem pumps	Fixed motors
	Dimension	15 U	15 Inline	15 PV	15 PT	15 MF
Displacement	cm^3 [in^3]	15 [0.913]	15 [0.913]	15 [0.913]	15 [0.913] x2	15 [0.913]
Shaft speed, minimum (pump)	min^{-1}(rpm)	1000	1000	1000	1000	—
Shaft speed, continuous	min^{-1}(rpm)	4000	4000	4000	4000	4000
Shaft speed, maximum	min^{-1}(rpm)	4200	4200	4200	4200	4200

Technical data Series 40 axial piston variable displacement pumps					
		Frame sizes			
	Dimension	025	035	044	046
Displacement	cm^3 [in^3]	25 [1.5]	35 [2.1]	44 [2.7]	46 [2.8]
Minimum speed	min^{-1}(rpm)	500	500	500	500
Rated speed	min^{-1}(rpm)	4000	3600	3300	4000
Maximum speed	min^{-1}(rpm)	5000	4500	4100	4100

Technical data Series 40 axial piston fixed and variable displacement motors						
			Frame sizes			
		Dimension	025	035	044	046
Displacement		cm^3 [in^3]	25 [1.5]	35 [2.1]	44 [2.7]	46 [2.8]
Rated speed	Max. disp.	min^{-1}(rpm)	4000	3600	3300	4000
	Min. disp.	min^{-1}(rpm)	-	5300	4850	5000
Maximum speed	Max. disp.	min^{-1}(rpm)	5000	4500	4100	4100
Max. flow at rated speed	Fixed motor	l/min	100.3	126.1	143.5	—
	Fixed motor	[US gal/min]	[26.5]	[33.3]	[37.9]	—
Max. flow at rated speed	Variable motor	l/min	—	126.1	143.5	183.6
	Variable motor	US gal/min	—	33.3	37.9	48.5
Max. corner power		kW [hp]	71 [95.2]	92 [123.4]	105 [140.8]	110 [147.5]

Technical data Series 42 axial piston variable pumps				
		Frame Sizes		
	Dimension	028	041	051
Displacement	cm^3 [in^3]	28 [1.7]	41 [2.5]	51 [3.1]
Minimum speed	min^{-1}(rpm)	500	500	500
Rated speed	min^{-1}(rpm)	3400	3200	3200
Maximum speed	min^{-1}(rpm)	3750	3600	3400

Technical data K and L frame axial piston 2-position motors						
		L Frame Sizes			K Frames Sizes	
	Dimension	25	30	35	38	45
Maximum displacement	cm^3 [in^3]	25 [1.5]	30 [1.8]	35 [2.1]	38 [2.32]	45[2.5]
Maximum speed - max. angle	min^{-1}(rpm)	4000	3900	3800	4000	3900
Maximum speed - min. angle	min^{-1}(rpm)	5500	5250	5000	5200	5050
Maximum pressure	bar [psi]	415 [6019.1]	350 [5076.3]	280 [4061.1]	415 [6020]	350 [5075]
Continuous pressure	bar [psi]	210 [3045.8]	175 [2538.2]	140 [2030.5]	210 [3045]	175 [2540]
Theoretical torque	N•m/bar [lbf•in/1000psi]	0.40 [244]	0.48 [293]	0.56 [342]	0.60 [366]	0.72 [439]

The above data gives an overview of standard components. For special requests contact Sauer-Danfoss.

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Technical data Series 90 axial piston variable displacement pumps

		Frame Sizes						
	Dimension	042	055	075	100	130	180	250
Displacement	cm^3 [in^3]	42 [2.6]	55 [3.4]	75 [4.6]	100 [6.1]	130 [7.9]	180 [11.0]	250 [15.3]
Minimum speed	min^{-1}(rpm)	500	500	500	500	500	500	500
Rated speed	min^{-1}(rpm)	4200	3900	3600	3300	3100	2600	2300
Maximum speed	min^{-1}(rpm)	4600	4250	3950	3650	3400	2850	2500

Technical data Series 90 axial piston fixed and variable displacement motors

			Frame sizes				
		Dimension	042	055	075	100	130
Displacement		cm^3 [in^3]	42 [2.6]	55 [3.4]	75 [4.6]	100 [6.1]	130 [7.9]
Rated speed	Max. angle	min^{-1}(rpm)	4200	3900	3600	3300	3100
	Min. angle		—	4600	—	—	—
Maximum speed	Max. angle	min^{-1}(rpm)	4600	4250	3950	3650	3400
	Min. angle		—	5100	—	—	—
Max. flow at rated speed		l/min	193	234	296	365	442
		[US gal/min]	[51]	[62]	[78]	[96]	[117]
Max. corner power		kW [hp]	155 [207]	187 [251]	237 [318]	292 [393]	354 [475]

Technical data Series 51 and 51-1 bent axis variable displacement motors

			Frame sizes				
		Dimension	060	080	110	160	250
Displacement	Max. angle	cm^3 [in^3]	60 [3.7]	80.7 [4.9]	109.9 [6.7]	160.9 [9.8]	250 [15.3]
	Min. angle	cm^3 [in^3]	12 [0.7]	16.1 [1.0]	22 [1.3]	23.2 [2.0]	50 [3.1]
Rated speed	Max. angle.	min^{-1}(rpm)	3600	3100	2800	2500	2200
	Min. angle.	min^{-1}(rpm)	5600	5000	4500	4000	3400
Maximum speed	Max. angle	min^{-1}(rpm)	4400	4000	3600	3200	2700
	Min. angle	min^{-1}(rpm)	7000	6250	5600	5000	4250
Max. flow at rated speed		l/min	216	250	308	402	550
		[US gal/min]	[57]	[66]	[81]	[106]	[145]
Max. corner power		kW [hp]	330 [443]	403 [540]	492 [660]	644 [864]	850 [1140]

Technical data Series IPS-2 integrated pump system

	Dimension	IPS-2	
Displacement	cm^3 [in^3]	75 [4.6]	44 [2.7]
Minimum speed	min^{-1}(rpm)	500	
Rated speed	min^{-1}(rpm)	3000	
Maximum speed at maximum displacement	min^{-1}(rpm)	3300	

Technical data Series CR&CW compact roller and wheel drives

Motor Series	Frame Size	Displacement cm^3 [in^3]	Style	CW12	CW18	CR31	CR51
90	042	42 [2.6]	Fixed	●	●	—	—
	055	55 [3.4]	Fixed	●	●	●	—
			Variable	●	●	—	—
	075	75 [4.6]	Fixed	—	—	●	—
51	060	60 [3.7]	Variable	●	●	—	—
	080	80.7 [4.9]	Variable	●	●	●	—
	110	109.9 [6.7]	Variable	—	—	●	●
Maximum output torque			N•m [lbf•ft]	12 000 [8850]	18 000 [13 276]	31 000 [22 864]	51 000 [37 616]
Maximum speed			min^{-1}(rpm)	200	180	50	50
Gear ratio				18 - 22 - 27 - 35 - 42 - 51:1	26 - 36 - 42 - 51:1	45 - 57 : 1	50 - 73 : 1

Technical data axial piston pumps and motors for transit mixer Series TMP/TMM

		Frame Sizes	
	Dimension	070	089
Displacement	cm^3 [in^3]	69.8 [4.26]	89.0 [5.43]
Minimum speed (variable pump)	min^{-1}(rpm)	400	400
Rated speed (maximum angle)	min^{-1}(rpm)	2900	2900
Theoretical torque	N•m/bar [lbf•in/1000 psi]	1.11 [677]	1.42 [866]
Maximum flow	l/min [US gal/min]	223 [58.9]	258 [68.2]
Maximum corner power (fixed motor)	kW [hp]	156 [209]	181 [243]

Technical data transit mixer gearbox TMG

	Dimension	TMG 51.2	TMG 61.2	TMG 71.2
Maximum output torque	N•m [lbf•ft]	51 000 [37 616]	61 000 [44 991]	71 000 [52 367]
Gear ratio		103:1	112:1	131:1
Maximum output speed	min^{-1}(rpm)	20	20	20
Lubrication oil capacity	l [US gal]	12 [3.17]	16 [4.2]	16 [4.2]
Drum size	m^3 [yd^3]	8 [10]	10 [13]	10 [13]

The above data gives an overview of standard components. For special requests contact Sauer-Danfoss.

Open circuit gear units and axial piston pumps

Sauer-Danfoss offers a wide variety of open circuit products. Our fixed and variable pumps provide power for work functions of on- and off-highway vehicles and equipment in the fields of agriculture, construction, material handling, and many other areas.

Open circuit solutions
Fixed displacement gear pumps and motors, and variable displacement piston pumps are a perfect choice when equipping applications like forklift trucks, tractors, and road rollers.

Our portfolio includes customized pump solutions, in which several functions are integrated in one body to optimize size and cost. By combining products we can offer system solutions, like fan drive systems for buses, wheel loaders, and other heavy equipment.

Features and benefits:
- Motor inlet pressures up to 250 bar [3626 psi]
- Full series operation capability
- European and SAE flange and shaft options
- O-ring boss ports, SAE and European 4 bolt split-flange ports
- Radial and axial case drain option
- Single and multiple configurations
- Integral valves (requires special rear cover)
- Fan drive versions with integral control and relief valves

Gear pumps and motors (SKP, SNP, YCC, 25 SP, CP and D series)
For light vehicles such as aerial lifts, greens and fairway mowers, and electric powered forklifts, Sauer-Danfoss offers SKP1 and SKP2 pumps. YCC pumps can be used where compact multi-section pumps are required. The pumps feature integral valves, pressure balanced design for high efficiency, and extruded aluminum bodies for high strength.

For medium-sized vehicles such as tractors, internal combustion forklifts, and skid steer loaders, we offer the 25SP aluminum pump, or where a heavy-duty pump is required, the cast iron D Series. Both pumps feature SAE A and B mounts, integral valves, and high-performance DU bushings.

For larger off-highway vehicles like tractors, backhoe loaders, dumpers, and telescopic material handlers, we offer the SNP3 as well as the heavy-duty CP range of pumps.

Integrated packages (IP)
An integrated hydraulic package is a combination of pumps, valves, filters, fittings, plumbing, ports, P.T.O.s etc. designed to simplify hydraulic system installations.

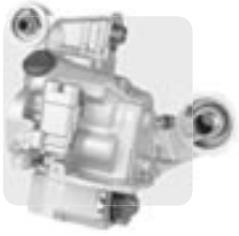
Integrated pumps can be :
- Simple: A tandem gear pump with special inlet adapter, or a single gear pump with filter and external drive gear
- Intermediate: A tandem gear pump with customized mounting, filter mount, relief valve and external drive gear
- Complex: 2 gear pumps and 1 piston pump with 3 filter mounts, 6 valves, custom mounting flange, 24 ports, gear drive train, internal galleries replacing external plumbing, and a mount for a third party valve

Cost-effective system integration
Integrated package pumps are ideal solutions for manufacturers of agricultural and on-highway vehicles. Sauer-Danfoss has participated in many in-depth studies on the cost benefits of system integration, and it has consistently been shown that savings of 30% are realistic and achievable.


D SERIES


SKP2


SNP 2


INTEGRATED PUMP PACKAGE FOR TRACTORS

Axial Piston Pumps (Series 45)
Series 45 open circuit axial piston pumps can be applied with other products in a system to transfer and control hydraulic power. They provide an infinitely variable flow rate between zero and maximum. The pumps are compact, high power-density units, using the axial piston concept in conjunction with a tiltable swashplate to vary the pump displacement.

Features and benefits:

- Robust design using the proven methods of quality function deployment (QFD) and design for manufacturability (DFM)
- Wide range of low cost installation options
- Control system flexibility: pressure compensated, load sensing, and remote pressure compensated controls
- High power auxiliary drives for multiple pump configurations
- Low noise levels
- Unique design increases reliability (no gasketed joints)
- Compact size

SERIES 45
FRAME E

SERIES 45
FRAME J

SERIES 45
FRAME H

SERIES 45
FRAME G

Technical data

Open circuit gear units and axial piston pumps

Gear pump product range				
Model	Mounting flange	Displacement range cm^3/rev [in^3/rev]	Max rated pressure bar [psi]	Features
TFP 50	Special 2-bolt	0.25 - 1.2 [0.015 - 0.07]	180 [2610]	Special power-pack versions available Bi-rotational pump version available
SNP 1	European 4-bolt	1.2 - 7.7 [0.1 - 0.5]	250 [3625]	Available with internal drain relief valve Special power-pack versions available
SKP 1	SAE A-A 2-bolt	1.2 - 12 [0.1 - 0.7]	250 [3625]	Available with internal drain relief valve Special power-pack version available
YCC (Multiple Pumps)	SAE A 2-bolt	9.5 - 14 [0.6 - 0.9]	172 [2495]	Compact multiple pump configuration
SNP 2 SKP 2	European 4-bolt etc. SAE A 2-bolt	3.9 - 25.2 [0.2 - 1.5]	250 [3625]	Available with priority flow divider, flow control valve, internal/external drain relief valves
D Series	SAE A 2-bolt SAE B 2-bolt	7.0 - 41.0 [0.4 - 2.5]	241 [4000]	Cast-iron range Single and compact multiple units
SNP 3	European 4-bolt etc. SAE B 2-bolt	22.1 - 88.2 [1.4 - 5.4]	250 [3625]	Available with integral relief valve, priority flow divider
35 CI	SAE B 2 & 4-bolt	26.0 - 70.0 [1.6 - 4.3]	275 [2989]	Special variants with integral charge-pressure priority valves available
CP 180	SAE B 2-bolt	32.9 - 97.5 [2.0 - 6.0]	250 [3625]	Cast iron body, aluminum flange cover. Single and tandem and multiple with priority flow divider
CP222	SAE C 2 & 4 -bolt	64.8 - 162.0 [4.0 - 9.9]	207 [3002]	Cast iron body, aluminum flange and cover

Gear motor product range					
Model	Mounting flange	Displacement range cm^3/rev [in^3/rev]	Max rated pressure bar [psi]	Features	
SKU1 SKM1	European 4-bolt and SAE A-A 2-bolt	0.26 - 12 [0.2 - 0.7]	250 [3625]	Unidirectional (SKU1) and bi-rotational (SKM1) - SAE A-A 9T splined, 1:8 & 1:5 taper, 12 and keyed 12.7 mm - O-ring boss ports, Euro 4-bolt ports	- European/metric options
SNU2 SNM2	European 4-bolt and SAE A 2-bolt flanges	8.4 - 25.2 [0.5 - 1.5]	250 [3625]	Unidirectional (SNU2) and bi-rotational (SNM2) - SAE A 9T spline, 1:8 and 1:5 taper, 15 and 15.875 mm keyed - O-ring boss ports, European 4-bolt ports - Integral valves (special rear cover) - Fan drive versions with integral control and relief valves	- Radial case drain option - European/metric options
SNU3 SNM3	European 4-bolt flange SAE B 2-bolt	22.1 - 63.4 [1.4 - 3.9]	250 [3625]	Unidirectional (SNU3) and bi-rotational (SNM3) - SAE B 13T spline, 1:8 and 1:5 taper, 22; 22.225 and 24mm keyed - O-ring boss ports, SAE B and Euro 4-bolt ports, split flange ports - Motor mounted fan drive versions control and relief valves	- European/metric options
MYCP	SAE A 2-bolt flange	9.5 - 31.8 [0.6 - 1.9]	240 [3481]	Unidirectional and bi-rotational - SAE A 11T spline and 9T spline - 0.75in. straight. key shaft	- O-ring boss ports - A/C checks available

The above data gives an overview of standard components. For special requests contact Sauer-Danfoss.

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Technical data Series 45 frames L, K, and H							
	Units	L25C	L30D	K38C	K45D	H57B	H75D
Displacement	cm^3 [in^3]	25 [1.5]	30 [1.8]	38 [2.3]	45 [2.7]	57 [3.5]	75 [4.6]
Continuous. Pressure	bar [psi]	260 [3371]	210 [3046]	260 [3771]	210 [3046]	310 [4495]	210 [3046]
Max. Pressure	bar [psi]	350 [5076]	300 [4351]	350 [5076]	300 [4351]	400 [5800]	300 [4351]
Rated Speed	min^{-1}(rpm)	3200	3200	2650	2650	2600	2400
Max. Speed	min^{-1}(rpm)	3600	3600	800	2800	3200	2800
Weight	kg [lb]	19 [42]	19 [42]	19 [42]	19 [42]	24 [52]	24 [52]

Technical data Series 45 frame J						
	Units	J45B	J51B	J60B	J65C	J75C
Displacement	cm^3 [in^3]	45 [2.75]	51 [3.11]	60 [3.66]	65 [4.00]	75 [4.58]
Continuous Pressure	bar [psi]	310 [4495]	310 [4495]	310 [4495]	260 [3770]	260 [3770]
Max. Pressure	bar [psi]	400 [5800]	400 [5800]	400 [5800]	350 [5076]	350 [5076]
Rated Speed	min^{-1}(rpm)	2800	2700	2600	2500	2400
Max. Speed	min^{-1}(rpm)	3360	3240	3120	3000	2880
Weight	kg [lb]	27 [59]	27 [59]	27 [59]	27 [59]	27 [59]

Technical data Series 45 frames G and E						
	Units	G74B	G90C	E100B	E130B	E174cc
Displacement	cm^3 [in^3]	74 [4.5]	90 [5.5]	100 [6.1]	130 [7.9]	147 [9.0]
Continuous. Pressure	bar [psi]	310 [4496]	260 [3771]	310 [4496]	310 [4496]	260 [3771]
Max. Pressure	bar [psi]	400 [5800]	350 [5076]	400 [5800]	400 [5800]	350 [5076]
Rated Speed	min^{-1}(rpm)	2400	2200	2450	2200	2100
Max. Speed	min^{-1}(rpm)	2800	2600	2880	2600	2475
Weight	kg [lb]	29 [64]	29 [64]	54 [118]	54 [118]	54 [118]

The above data gives an overview of standard components. For special requests contact Sauer-Danfoss.

Orbital Motors

Sauer-Danfoss offers a wide range of low-speed hydraulic motors designed for moderate to heavy load requirements. With the many variants available, it is always possible to find the optimum orbital motor solution for your specific application needs.

Orbital motors
Sauer-Danfoss low-speed, high-torque motors are used in a wide variety of construction, agriculture, turf care, material handling, and forestry applications. They are ideal solutions for both machine propel and work functions.

Features and benefits:
- High efficiency
- Smooth running over entire speed range
- Constant operating torque
- High starting torque
- High pressure shaft seal
- Long life under extreme operating conditions
- Robust and compact design
- High radial and axial bearing capacity
- For applications in both open and closed loop hydraulic systems

Mini motors (OML and OMM)
Sauer-Danfoss mini motors are ideal for work functions in the mobile sector, for example, mobile conveyors in harvesting machines.
- Spool valve integrated with output shaft
- Gearwheel set with fixed rim
- Suitable for long periods of operation at moderate pressure

Medium sized motors (OMP, DH, OMR, DS, OMH, OMEW)
Sauer-Danfoss medium sized motors are light and compact and therefore easy to install in equipment such as forklifts, turf care machinery, aerial lifts, skid steer loaders, and trenchers.
- Spool valve is integrated with output shaft, except for OMEW which has a disc valve
- OMP and DH have a fixed gear rim and are ideal for long periods of operation at moderate pressure
- OMR/DS/OMH/OMEW have a gear rim with rollers and are suitable for long periods of operation at high pressure
- OMP, OMR, and OMEW are available as wheel motors with a recessed mounting flange

Large motors (OMS, OMT, OMV, TMK, TMT)
For demanding operating conditions, Sauer-Danfoss offers a range of large orbital motors.
- Output shaft with tapered roller bearings gives high radial loading capacity
- Gear rim with rollers, separate valve drive, and disc valve
- High volumetric and mechanical efficiency
- Long operating life at high pressures
- Short and ultra-short (without bearings and output shaft) versions possible


DH/DS


OMM


OMP


OMV


OMT


OMEW


OMS


TMT


OMR

Technical data

Orbial motors

Orbital motor overview				
Motor type	Displacement	Pressure drop (Continuous/Intermittent/Peak)	Flow (Continuous)	Max output (Intermittent)
	cm^3 [in^3]	bar [psi]	l/min [US gal/min]	kW [hp]
OML	8 - 32 [0.49 - 1.95]	70 / 125 / 140 [1000 / 1800 / 2000]	16 [4.2]	2 [2.7]
OMM	8 - 50 [0.49 - 3.07]	100 / 140 / 200 [1450 / 2000 / 2900]	20 [5.5]	3.2 [4.4]
OMP	25 - 400 [2.96 - 23.80]	140 / 175 / 225 [2000 / 2500 / 3300]	60 [16.0]	13 [18.0]
DH	36 - 400 [2.20 - 23.80]	125 / 165 [1800 / 2400]	60 [16.0]	12 [16.0]
OMR	50 - 375 [3.15 - 22.72]	175 / 200 / 225 [2500 / 2900 / 3300]	60 [16.0]	15 [20.0]
DS	50 - 375 [3.15 - 22.7]	140 / 175 [2000 / 2500]	60 [16.0]	13 [18.0]
OMH	200 - 500 [12.28 - 28.72]	175/ 200 / 225 [2500 / 2900 / 3300]	75 [20.0]	18.5 [25.0]
OMEW	100 - 400 [6.10 - 24.4]	200 / 210 / 225 [2900 / 3000 / 3300]	60 [16.0]	15 [20.0]
OMS	80 - 500 [4.91 - 30]	210 / 275 / 295 [3050 / 3990 / 4280]	75 [20.0]	22.5 [30.2]
TMKW	160 - 470 [10 - 29]	250 / 325 / 350 [3600 / 4700 / 5000]	80 [21.1]	27 [36.0]
OMT	160 - 500 [9.83 - 31.95]	200 / 240 / 280 [2900 / 3500 / 4050]	125 [33.0]	40 [54.0]
TMT	250 - 630 [15.25 - 38.43]	250 / 350 / 400 [3600 / 5000 / 5800]	125 [33.0]	70 [95.0]
OMV	315 - 800 [19.18 - 48.91]	200 / 240 / 280 [2900 / 3500 / 4050]	200 [53.0]	64 [87.0]
TMVW	400 - 800 [24 - 49]	250/350/400 3630/5080/5800	200 [63.4]	112 [150]

The above data gives an overveiw of standard components. For special requests contact Sauer-Danfoss.

Valves

Sauer-Danfoss valves are designed to be flexible, which allows them to meet virtually any need. The modularity of our directional control valves, the variety of our cartridge valves — as well as the flexibility of our electrohydraulic products — allows Sauer-Danfoss valves to be used in applications ranging from road building and construction machinery to agriculture and forestry equipment.

Proportional load-sensing valves (PVG)
Our family of proportional load-sensing valves includes two series. The PVG 32, and PVG 120 are available individually or as a hybrid assembly.

PVG 32 is a pressure compensated, hydraulic load-sensing valve designed to give maximum flexibility. It is available in many versions, from a simple load sensing directional valve to an advanced electronically-controlled, load-independent proportional valve. The modularity of the PVG 32 makes it possible to build a valve group to precisely meet your requirements. Regardless of the configuration specified, the compact external dimensions of the valve remain unchanged.

Features and benefits of PVG 32:

- Max flow per section of 130 l/min [34 US gal/min]
- Working pressures up to 350 bar [5075 psi]
- Load-independent flow control
- Up to 10 sections per valve group
- Open-center versions for systems with fixed displacement pumps
- Closed-center version for systems with variable displacement pumps
- A variety of available spool types (open, closed, float position, etc.) for flexibility of design
- Interchangeable spools for easy flow characteristic modifications
- A variety of actuator options incorparating an enclosed spool design to extend seal life and minimize contaminate ingress
- Integrated electronics, sensors, and actuators for precise control and increased productivity
- Standard feedback transducer provides optimal control regardless of viscosity changes, supply voltage, or flow
- CAN-bus network options including intelligent control functions (ramp, adjustable flow limiting, dead band compensation, etc.)
- Electrical controls with integral connectors for durability in mobile applications
- Compact design with high power density

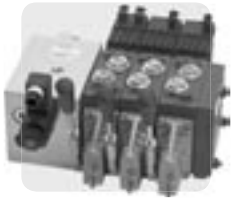
Like the PVG 32, the **PVG 120** is a combined directional control valve operating according to the load-sensing principle. Its modular capability makes it possible to build a valve group that controls all your machine functions.

Features and benefits of PVG 120:

- Many of the same features as PVG 32
- Max flow per section of 239 l/min [63 US gal/min]
- Max pressure to 400 bar [5800 psi]
- Up to 8 valve sections per group

PVG 32

PVE



COMBINED PVG 32 AND HIC

PVG 120

Directional Control Valves (DCV)
Sauer-Danfoss manufactures mobile control valves for applications up to 100 l/min [26 US gal/min]. Typical uses include controlling hydraulic systems on construction, agricultural, turf care, on-highway car transport, and refuse applications.

Our line of directional control valves are available as monoblock, stack, or mono-stack in series, parallel, or tandem circuits. Monoblock valves are offered in one, two or three section units. Stack valves can have as many as twelve sections. Mono-stack valves in parallel circuit combine the lower manufacturing cost of a monoblock with the versatility of a stack valve. Two to six spools are standard. Through optimized coring, higher efficiencies are achieved to address increasing vehicle engine constraints.

Features and benefits of DCV:

- Series, parallel, or tandem circuit valves equipped with handles
- Joystick, electrical, hydraulic, and pneumatic control options
- Various check options (load holding, pilot operated, and low-leakage)
- Wide range of port sizes & types
- Valves may be delivered painted or unpainted
- Hydraulic unlock actuation
- Relief valves with or without anti-cavitation
- Float spools
- Mechanical joysticks
- Cable controls
- Mid-inlet combiner/divider sections
- Custom-designed valves available

Hydraulic Integrated Circuits (HIC)
HICs integrate standard cartridge valves into a common manifold. In addition to the standard range, blocks can be specially designed to meet your circuit requirements. The use of HICs substantially reduces the number of external hydraulic connections. Due to their minimal installation time and compact size and weight, HICs improve system performance and simplify maintenance.

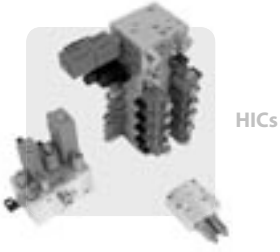
Cartridge valves
Sauer-Danfoss manufactures a wide variety of directional control, flow and pressure regulating, and load holding cartridge valves.

The range of pressure-regulating valves includes direct-acting, pilot-operated, sequence, pressure reducing, and overcenter valves. They allow flow up to 380 l/min [100 US gal/min] and pressures up to 420 bar [6092 psi].

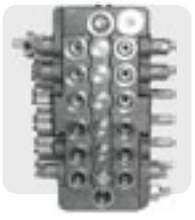
The range of flow-regulating valves includes pressure-compensated flow-regulating valves, flow dividers and combiners, and needle valves.

The range of directional control valves includes solenoid operated two-way, three-way, and four-way two and three position valves. They allow flow up to 225 l/min [59 US gal/min] and pressure up to 350 bar [5076 psi].

The range of proportional valves includes pressure reducing, relief, and flow control valves. They allow flow up to 75 l/min [20 US gal/min] and pressure up to 350 bar [5076 psi].



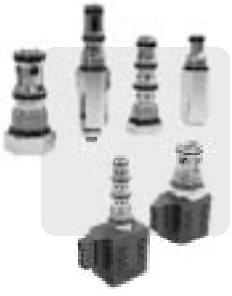
HICs



DCV

DVC WITH CABLE SPOOL CONTROL

DCV WITH ELECTRICAL SPOOL CONTROL



CARTRIDGE VALVES

Technical data
Valves

High flow modular valves

Valve Series	l/min [US gal/min]						Number of Sections	Circuit
	40 [10]	80 [20]	120 [30]	160 [40]	200 [50]	240 [60]		
PVG 120					180 [48]		1 to 8	Parallel

Modular valves

Valve Series	l/min [US gal/min]						Number of Sections	Circuit
	20 [5]	40 [11]	60 [16]	80 [26]	100 [26]	120 [32]		
PVG 32					100 [26.4]		1 to 10	Parallel
CDS 100					100 [26.4]		1 to 12	Series/Parallel Tandem
CDS 60			60 [16]				1 to 12	Series/Parallel Tandem
1681			57 [15]				1 to 7	Parallel
1125		38 [10]					1 to 8	Parallel

Monoblock valves

Valve Series	l/min [US gal/min]						Number of Spools	Circuit
	20 [5]	40 [11]	60 [16]	80 [26]	100 [26]	120 [32]		
1421					95 [25]		1	Tandem
1025				78 [21]			1	Tandem
1225				78 [21]			2	Tandem
1612				78 [21]			1	Tandem
1622			64 [17]				2	Series
1632			64 [17]				3	Series
1617		38 [10]					1	Parallel
1627		38 [10]					2	Parallel
1637		38 [10]					3	Parallel
1618		38 [10]					1	Parallel
1638		38 [10]					3	Parallel
1635	26 [7]						3	Tandem
1500	26 [7]						1	Tandem
1530	23 [6]						1	Tandem

Indicates maximum working pressure rated at 350 bar [5000 psi]

Indicates maximum working pressure rated at 210 bar [3000 psi]

Indicates maximum working pressure rated at 104 bar [1500 psi]

Cartridge valves

	NFPA cavity size					
	-4	-8	-10	-12	-16	-20
	7/16-20 UNF	3/4-16 UNF	7/8-14 UNF	1 1/16-12 UN	1 5/16-12 UN	1 5/8-12 UN
Directional controls						
Check valve	●	●	●	●	●	●
Check valve, reverse flow	●	●	●	●	●	●
Check valve with orfice			●			
Shuttle valve	●	●	●			
Hot oil shuttle valve			●	●		
Manual valve, 2-way/2-position			●			
Manual valve, 3-way/2-position			●			
Manual valve, 4-way/2-position			●			
Manual valve, 4-way/3-position			●			
Directional valve, 2-way/2-position, hydraulic pilot			●		●	●
Directional valve, 3-way/2-position, hydraulic pilot			●		●	●
Directional valve, 4-way/2-position, hydraulic pilot			●		●	●
Solenoid valve, 2-way/2-position, bi-directional poppet		●				
Solenoid valve, 2-way/-position, poppet, normally-open		●	●	●	●	●
Solenoid valve, 2-way/2-position, poppet, normally closed		●	●	●	●	●
Solenoid valve, 2-way/2-position, spool		●	●			
Solenoid valve, 3-way/2-position, spool		●	●	●		
Solenoid valve, 4-way/2-position, spool		●	●			
Solenoid valve, 4-way/3-position, spool		●	●			
Electro-proportional directional control, 4-way			●			
Flow controls						
Needle valve		●	●	●	●	●
Needle valve, fine metering		●				
Needle valve, free-reverse flow			●			
Flow control, restrictive, pressure-compensated		●	●	●		
Flow control, bypass, pressure-compensated			●	●	●	
Flow divider/combiner			●	●	●	●
Proportional flow control, hydralic pilot					●	
Electro-proportional flow control, normally-open		●				
Electro-proportional flow control, normally-close		●	●	●		
Load holding						
Pilot-to-open check valve		●	●	●	●	●
Pilot-to-close check valve		●	●	●	●	
Counterbalance valve		●	●	●		●
Pressure controls						
Relief valve, direct-acting poppet		●	●			
Relief valve, differential area poppet		●	●	●		
Relief valve, bi-directional poppet			●			
Relief valve, direct-acting spool			●	●		
Relief valve, pilot-operated spool			●	●		
Pressure reducing/relieving valve, direct-acting			●			
Pressure reducing/relieving valve, pilot-operated			●	●		
Sequence valve, direct acting			●	●		
Sequence valve, pilot-operated			●	●		
Sequence valve, kick-down			●			
Sequence valve, unloading			●			
Pressure compensator, restrictive-type			●	●	●	
Pressure compensator, priority-type			●	●	●	
Logic element			●	●	●	
Electro-proportional relief valve, normally-open		●				
Electro-proportional relief valve, normally-close		●	●			
Electro-proportional pressure reducing/relieving valve		●	●			

Steering components and systems

OSPL

OSPM

OSPC LS/
OSPF LS

Sauer-Danfoss offers system level as well as component level steering solutions. Our product range makes it possible to cover applications of all types, ranging from ordinary 2-wheel steering (also known as Ackermann steering) to articulated steering, complicated 4-wheel steering, automatic steering by sensor, and remote controlled steering.

The primary Sauer-Danfoss steering components are:

- Standard OSP steering units
- OSPM mini steering units
- EHPS electrohydraulic power steering units
- TAD torque amplifiers
- Various accessories
- OLS priority valves
- OPT flow amplifiers
- Fixed, tiltable, and telescopic steering columns
- Steering wheels

For **light vehicles** such as garden tractors, utility vehicles, lawn mowers, or small forklift trucks, Sauer-Danfoss offers OSPM mini hydrostatic steering units.

Small and medium sized vehicles can be equipped with an OSPB, OSPC, OSPF or OSPR steering unit. Typical applications include tractors, harvesters, forklift trucks, and small construction machines.

Larger vehicles such as combines, loaders, and dump trucks will typically use OSPB, OSPC, or OSPF steering units. The OSPL steering unit is particularly suitable when steering flow requirements reach 100 l/min [26.4 US gal/min]. However, for vehicles this size, Sauer-Danfoss has specifically designed the OSPQ and OSPD. These steering units are designed with variable displacements to make emergency steering possible even on heavy machines. The unit changes automatically to lowest displacement when pump oil supply is unavailable.

For vehicles with a total weight exceeding 100 tons and a needed steering flow of up to 400 l/min [105.7 US gal/min], the OSQ flow amplifier is available.

On loaders, large forklift trucks, dump trucks, large tractors, and other heavy vehicles, there is often a need for electrically actuated steering. For such purposes Sauer-Danfoss has created the EHPS system. As an alternative to the normal steering wheel, the EHPS system may be activated by a joystick.

OTP
STEERING
COLUMN

OSPR

OSPD

OSPQ

Features and benefits of OSP steering units:
- Low steering torque: 0.5 N•m to1.8 N•m [4.4 lbf·in to 15.9 lbf·in] in normal steering situations
- Low noise level
- Many types available: open center non-reactive, open center reactive, load sensing, and load sensing reactive
- Built-in valve functions: relief valves, check valves, check valves in the pressure line or in the load sense line
- DIN, ISO, and SAE port connections

Special OSPM benefits:
- Compact design and small dimensions
- Optional integrated steering column
- Fittings integrated into end ports

EH steering valve:
- Ideal for machinery controlled by joystick or mini steering wheel
- Uses PVG 32 technology
- Fits onto OSPC or OSPF
- 12, 20, or 40 l/min [3.17, 5.28, or 10.57 US gal/min] flow rates

Advantages of EHPS system:
- High steering pressure requiring smaller cylinders and oil flow
- Low pilot pressure – maximum of 30 bar [435 psi] – for extremely low noise level in the cab
- Smoother operation on vehicles with articulated steering
- Optional combination with Sauer-Danfoss PVG 32 proportional valves
- Emergency steering possible even heavy vehicles

TAD torque amplifier attributes:
- Hydromechanical operation
- Transmission ratio of 1:3
- Operates as manual steering if the oil supply fails

OLS priority valves:
- Types: static or dynamic
- Flow from 40 to 160 l/min [10.50 to 42.25 US gal/min]
- Maximum system pressure 350 bar [5075 psi]

OSQ flow amplifiers:
- For vehicles with a total wight exceeding 100 tons and a needed steering flow of up to 400 l/m [160 US gal/min]

OTP steering columns:
- Lengths from 45 to 1200 mm [1.8 to 47.25 in]
- Tiltable and/or telescopic

EHPS

OSQ FLOW AMPLIFIER

EH VALVE WITH PVE AND OSPF

DIRECT WHEEL MOUNT WITH OSPM

TILT COLUMN MOUNT WITH OSPM

Technical data

Steering components and systems

Concept	Types	Components	Recommended oil flow l/min [US gal/min]	Max. steering pressure bar [psi]	Displacement cm^3/rev [in^3/rev]	Accessories
Hydrostatic steering	OSP	OSPB	5 - 80 [1.3 - 21.1]	210* [3046]	50 -100 [3.1 - 61]	Steering columns: OTPB, OTP-T, and OTP-TT Valve blocks: OVP
		OSPR	7 - 32 [1.8 - 8.5]	175 [2538]	70 - 315 [4.3 - 19.2]	Steering columns: OTPB, OTP-T, and OTP-TT
		OSPC	4 - 50 [1.1 - 13.2]	210* [3046]	40 - 500 [2.4 - 30.5]	Steering columns: OTPB, OTP-T, and OTP-TT
		OSPC LS	4 - 40 [1.1 - 10.8]	210* [3046]	40 - 400 [2.4 - 24.4]	Steering columns: OTPB, OTP-T, and OTP-TT Priority valves: OLS and OLSA
		OSPF LS	4 - 40 [1.1 - 10.8]	210* [3046]	40 - 400 [2.4 - 24.4]	
		OSPD LS	7 - 44 [1.8 - 11.6]	210* [3046]	70 - 440 [4.3 - 26.9]	
		OSPQ LS	8 - 32 [2.1 - 8.5]	210* [3046]	80 - 320 [4.9 - 19.5]	
		OSPL LS	52 - 100 [13.7 - 26.4]	210 [3046]	520 - 1000 [31.7 - 61]	Steering columns: OTPB, OTP-T, and OTP-TT Priority valves: OLS Valves block: OVPL
	OSPM	OSPM	3 - 20 [0.8 - 5.3]	125 [1813]	32 - 100 [2.0 - 6.1]	Steering columns: OTPB, OTP-T and OTP-TT
Electrohydraulic steering	EHPS type 0	EHPS + OSPBX	up to 100 [up to 26.4]	250 [2176]		Steering columns OTPB, OTP-T, and OTP-TT for OSPCX
	EHPS type 1	EHPS + OSPBX + PVE	up to 100 [up to 26.4]	250 [2176]		Steering columns: OTPB, OTP-T, and OTP-TT for OSPCX Joysticks Steering wheels
	EHPS type 2	EHPS+ OSPBX + PVED	up to 100 [up to 26.4]	250 [2176]		
Hydromechanical steering	TAD	TAD	10 - 16 [2.6 - 4.2]	70 [1015]	100, 160 [6.1, 9.8]	Steering columns: OTPB, OTP-T, and OTP-TT
Accessories	OLS Priority valves	OLS A	40 or 80 [10.5 or 21.1]	250 [3625]		
		OLS	40, 80, 120, or 160 [10.5, 21.1, 31.7, or 42.3]	250 [3625] OLS160: 350 [5076]		
	OSQ Flow amplifiers	OSQA	240 [63.4]	210 [3045]	640-4160 [39-254]	
		OSQB	400 l/min [106 US gal/min]	210 bar [3045 psi]	640-4160v [39-254]	
	OTP Steering columns	OSQ + OSPBX	64 - 400 [16.9 - 105.7]	210 [3046]	640 - 4000 [391 - 244.1]	Steering columns: OTPB, OTP-T, and OTP-TT for OSPX
		OPT - TT				
		OTPB, OTP-T				
		OTPM, OTPM-T and OTPM-TT				
	Steering wheels					

*Steering pressure > 175 bar [2538 psi] with special spool sleeve set only.

The above data gives an overview of standard components. For special requests contact Sauer-Danfoss.

Back

Mobile electronic components and systems

Sauer-Danfoss is a comprehensive manufacturer and systems integrator of state-of-the-art electronics for off-road and on-highway OEMs. We offer a wide array of standard and custom products ranging from sensors and GPS systems, to machine embedded microcontrollers and displays, to AC and DC electric motors and electric power steering.

Our experience in designing hardened electronics for the mobile machine industry ensures operational longevity and low warranty costs. The advanced features of our electronic control solutions integrated with the power of Sauer-Danfoss hydraulics increases machine productivity and reliability.

Standard microcontrollers and vehicle networks
Our family of standard microcontrollers offers a wide selection of machine control solutions. Our latest line of PLUS 1 microcontrollers offers the flexibility to handle anything from small-scope applications to complete machine management systems. The powerful DSP based processing core ensures they will meet even your toughest control requirements.

Custom Electronics
In addition to standard electronic products, we have the design, engineering, manufacturing, and quality systems required to build cost-effective, custom electronic products tailored to your specific machine or application. We offer build-to-print, design, design and build, and application software development services.

Application Software & Service Tools
Effective application software is key to machine performance and Sauer-Danfoss can deliver. Our application capabilities range from packaged standard solutions such as PID speed control and load control, to customized total machine solutions.

Our powerful PLUS 1 GUIDE (Graphical User Integrated Development Environment) gives you the tools to easily build and customize your own application software. Draw from our expansive library of versatile PLUS 1 control objects to get a head start in building your application.

Operator interface devices
We offer a wide array of operator interface products, including steering wheels, joysticks, displays, and graphical terminals that enable precise control of machine operation and relay complex information to the operator. In addition to standard interface and display products, we work with our customers to develop custom controls and instrument clusters.

Sensors
Sauer-Danfoss speed, temperature, and pressure sensors measure and transmit machine-operating parameters. TSD, a Sauer-Danfoss joint venture with Topcon Controls supplies sonic, laser, and GPS control and positioning systems.

MICROCONTROLLERS

GRAPHICAL TERMINALS

ELECTRONIC JOYSTICK

PLUS 1
FLEXIBLE
JOYSTICK

PROF 1

PLUS 1 PDA
BASED SERVICE
TOOLS

PLUS 1 GUIDE
SOFTWARE
DEVELOPMENT
TOOLS

SENSORS

Electric drives

Sauer-Danfoss electric drive products and systems match the current needs of the forklift truck industry. Tough demands are part of everyday life for manufacturers of battery-powered vehicles. Today's customer expects cutting edge technology, a high level of operating comfort, and ready availability of a wide range of high-quality products. In addition, a growing number of customers now demand AC instead of DC technology.

Inverters
Sauer-Danfoss offers a wide range of inverters tailor-made for electric power steering applications, traction drives, and hydraulic pump drives. And, naturally, they can be used in combination with our full line of induction motors.

Specifically designed for the material handling industry, our range of inverters includes:
- Series A - all-purpose inverter 24, 48, and 80V; 20-600A
- Series B - for small pedestrian trucks 12, 24, and 36V; 60-120A
- Series C - for walkies, order-pickers, and small pedestrian trucks 24, 36, 48, and 80V; 40-480A
- Series D - for counter-balance trucks, reach trucks, and high level order pickers 24, 36, 48, and 80V; 160-750A
- Series E - for electric power steering applications 24, 36, 48, and 80V; 60-180A

Motors
Sauer-Danfoss provides a full line of DC motors and AC induction motors specifically designed for traction, pump, and steering operations in battery-powered vehicles. Typical applications include forklift trucks, walkies, tow tractors, and aerial-lifts.

DC motors, type TSL
Series wound, split field, compound wound, shunt wound, and permanent magnet DC motors are part of our product portfolio.

Product range:
- Traction motors ø 80-325 mm [3.15-12.8 in] 0.2-4 kW [0.3-5.4 hp], 12-200 V
- Pump motors ø 80-250 mm [3.15-9.84 in] 0.4-25 kW [0.5-33.5 hp], 24-80 V
- Steering actuators ø 80-150 mm [3.15 -5.91 in] 0.05-2 kW [0.7- 2.7 hp], 24-80 V
  Gear ratio: 18:1- 93:1

AC motors, type TSA
We offer standard squirrel-cage induction motors with or without integral feedback sensor.

Product range:
- Drive units, wheel diameter 230-406 mm [9.84-15.98 in], loads from 1000-4200kg [2200-9240 lb], 0.8-8 kW [1.1-10.7 hp]
- Motor-in-wheel assemblies, wheel diameter 150-406 mm [2.68-5.36 in]
  loads 200-3200 kg [440-7040 lb], 0.2-4.5 kW [0.3-6.0 hp]
- Motor axles Loads from 0-7800 kg [0-17 160 lb]
  Max power: 20 kW [26.8 hp]


HOUR METER
CHARGE
INDICATOR


TRACTION
& STEERING
SYSTEM


INVERTER


DRIVE AXLE

COMPLETE TRACTION-STEERING SYSTEM

MOTOR IN WHEEL DRIVE

DC-MOTORS

AC-MOTORS

Technical data
Electric drives

DC motor - type TSL

DC frame sizes														
Type		TSL 80	TSL 100	TSL 112	TSL 125	TSL 140	TSL 150	TSL 160	TSL 178	TSL 210	TSL 250	TSL 280	TSL 315	TSL 325
Voltage	144 - 240 V												●	●
	80 - 144 V										●	●	●	●
	48 - 80 V		●	●	●	●	●	●	●	●	●	●	●	●
	24 - 48 V		●	●	●	●	●	●	●	●	●	●		
	12 - 24 V	●	●	●	●	●	●							
Winding	PM	●	●	●	●		●							
	Series		●	●	●	●	●	●	●	●	●	●	●	●
	Compound		●	●	●	●	●	●	●	●	●	●	●	●
	Shunt		●	●	●	●	●	●	●	●	●	●	●	●
Application	Servo	●	●	●	●	●	●							
	Pump		●	●	●	●	●	●	●	●	●	●	●	
	Traction	●	●	●	●	●	●	●	●	●	●	●	●	●

Standard Core Length					
Type	Core length mm [in]		Type	Core length mm [in]	
TSL80B	90 [3.54]		TSL178C	140 [5.51]	
TSL100A	60 [2.36]		TSL210A	70 [2.76]	
TSL112A	62 [2.44]		TSL210B	85 [3.35]	
TSL112B	90 [3.54]		TSL210C	110 [4.33]	
TSL125A	62 [2.44]		TSL210D	140 [5.51]	
TSL125B	90 [3.54]		TSL250A	125 [4.92]	
TSL140A	71 [2.80]		TSL250B	160 [6.30]	
TSL140B	90 [3.54]		TSL250C	200 [7.87]	
TSL140C	112 [4.41]		TSL280A	140 [5.51]	
TSL150A	70 [2.76]		TSL280B	180 [7.09]	
TSL150B	100 [3.94]		TSL280C	225 [8.86]	
TSL160A	80 [3.15]		TSL315A	160 [6.30]	
TSL160B	100 [3.94]		TSL315B	200 [7.87]	
TSL160C	125 [4.92]		TSL315C	250 [9.84]	
TSL178A	85 [3.35]		TSL325A	130 [5.12]	
TSL178B	110 [4.33]				

AC motor - type TSA

AC frame sizes										
Type		TSA 106	TSA 120	TSA 135	TSA 150	TSA 170	TSA 200	TSA 240	TSA 270	TSA 300
Voltage	144 - 240 V						●	●	●	●
	80 - 144 V			●	●	●	●	●	●	●
	48 - 80 V	●	●	●	●	●	●	●	●	●
	24 - 48 V	●	●	●	●	●	●	●	●	●
	12 - 24 V	●	●	●	●	●	●	●	●	●
Winding	Inserted			●	●	●	●	●	●	●
	4 Poled	●	●	●	●	●	●	●	●	●
Application	Servo	●	●	●	●					
	Pump	●	●	●	●	●	●	●	●	●
	Traction	●	●	●	●	●	●	●	●	●

Standard core length					
Type	Core length mm [in]		Type	Core length mm [in]	
TSA106AA	40 [1.57]		TSA170C	180 [7.09]	
TSA106AB	50 [1.97]		TSA170D	210 [8.27]	
TSA106A	65 [2.56]		TSA200A	120 [4.72]	
TSA106B	90 [3.54]		TSA200AB	160 [6.30]	
TSA106C	120 [4.72]		TSA200B	180 [7.09]	
TSA120A	60 [2.36]		TSA200C	230 [9.06]	
TSA120B	90 [3.54]		TSA240A	160 [6.30]	
TSA120E	115 [4.53]		TSA240B	200 [7.87]	
TSA135A	75 [2.95]		TSA240C	240 [9.45]	
TSA135B	100 [3.94]		TSA270A	180 [7.09]	
TSA150AA	60 [2.36]		TSA270AB	210 [8.27]	
TSA150A	90 [3.54]		TSA270B	240 [9.45]	
TSA150B	120 [4.72]		TSA300AA	100 [3.94]	
TSA150C	150 [5.91]		TSA300A	200 [7.87]	
TSA170A	100 [3.94]		TSA300BB	270 [10.63]	
TSA170B	140 [5.51]				

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Motor in wheel drives

Type			MIWD 15	MIWD 21	MIWD P23	MIWD 24	MIWD L25	MIWD 27	MIWD 32	MIWD 35	MIWD 41	SPS 23	VD 23	VD25	VD 34	VD 41
Mechanical Data	Wheel load	kg [lb.]	200 [441]	600 [1322]	900 [1984]	800 [1764]	800 [1764]	1300 [2866]	1700 [3748]	2200 [4850]	3200 [7055]	900 [1984]	1000 [2205]	1400 [3086]	2600 [5732]	4200 [9259]
	Wheel diameter	mm [in]	150 [5.91]	210 [8.27]	230 [9.06]	240 [9.45]	250 [9.84]	270 [10.63]	318 [12.52]	353 [13.90]	406 [15.98]	230 [9.06]	230 [9.06]	254 [10.0]	343 [13.50]	406 [15.98]
	Wheel width	mm [in]	50 [1.97]	70 [2.76]	70 [2.76]	70 [2.76]	60 [2.36]	90 [3.54]	120 [4.72]	127 [5.0]	170 [6.69]	70 [2.76]	75 [2.95]	100 [3.94]	140 [5.51]	178 [7.01]
	Gear ratio	:1	9.9	24.0	28.0	24.0	24.8	15.9 22.9 33.8	22.0 33.0	22.6 34.2	18.8 24.7 31.3	18.0 30.0	13.9 18.0 21.0	14.7 20.5 14.5 21.4	17.7 19.9	19.9
	Install height	mm [in]	176 [6.93]	293 [11.54]	252 [9.92]	323 [12.72]	275 [10.83]	360 [14.17]	406 [15.98]	451 [17.76]	490 [19.21]	415 [16.39]	301 [11.85]	348.5 [13.72]	462 [18.19]	553 [21.77]
Motor	DC	Size	85	112 125		112 125	112	150	178	210	240	125 150	125 150	150	178 210	210
	AC			●	●	●	●	●	●	●	●	●	●	●	●	●
	Steering		●	●		●		●	●	●	●			●	●	●

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With Sauer-Danfoss technology inside, you can limit your number of suppliers, increase quality, and reduce overall machine costs.We offer high value mobile hydraulic and electric products, engineering services, and the on-going support you need. Our engineers can provide you with complete systems for your vehicle´s propel, work, and control functions as well as individual, off-the shelf components.

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No one wants to outsource design and production to just anyone. It takes something special to be chosen as a key supplier – to be invited inside. Sauer-Danfoss is a leading global manufacturer of engineered hydraulic systems, components, and electronics to off-highway OEMs in agriculture, construction, road building, materials handling, forestry, and turf care.We have become a preferred supplier by exceeding customer expectations and being committed, open, innovative, and reliable.

It's a fact. Sauer-Danfoss is one of the biggest suppliers around. Size in itself is nothing, though. What matters are the things we do and the way we do them. We want customers to think of us as "the local company just around the corner." And that is how we act. Our goal is to be, and continue to be, the most competent supplier around – the company inside tomorrow's off-highway machinery.

Reliability
Quality and reliability go hand-in-hand.With focus on product reliability and customer satisfaction, Sauer-Danfoss follows a quality strategy endorsed by all employees. Our commitment to quality is supported by policies, processes, and structures that secure continuous product and service improvement. We use Six Sigma and Lean concepts. All Sauer-Danfoss locations will be ISO 9000:2000 certified in the near future – several already are. And 250 Defects Per Million is our official goal.

We have created a company culture where customer focused quality is always the main objective. "DNA card" is the word employees have started using about a small plastic card they carry, that briefly outlines Sauer-Danfoss´s primary quality goals. Quality is not a fancy buzzword to us. We are serious about it, but for selfish reasons. Our commitment to quality is what makes our products and services so reliable. OEMs like reliability. It's that simple. Reliability pays.

Openness
We admit it. The systems and components inside your machine are not all we care about. Recognizing that our employees are the creative engine for making high value mobile solutions, we put them first. Enthusiastic talents – the people inside Sauer-Danfoss – are our strongest competitive asset. They can be yours as well.

Employees with different backgrounds and perspectives are essential for success in today's fast-paced, global marketplace. Working in 22 countries, we are a rich mix of diverse nationality, culture, and thought. We are proud of that. Each employee has the opportunity to develop and the obligation to learn. We respect individual differences and care about the health and safety of our colleagues. Sauer-Danfoss is its people.

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Sauer-Danfoss is a comprehensive supplier providing complete systems to the global mobile market. We offer our customers optimum solutions for their needs and develop new products and systems in close cooperation and partnership with them. Sauer-Danfoss specializes in integrating a full range of system components to provide vehicle designers with the most advanced total system design.

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- Bent axis motors
- Orbital motors
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- Planetary compact gears
- Proportional valves
- Directional spool valves
- Cartridge valves
- Hydraulic integrated circuits
- Hydrostatic transaxles
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