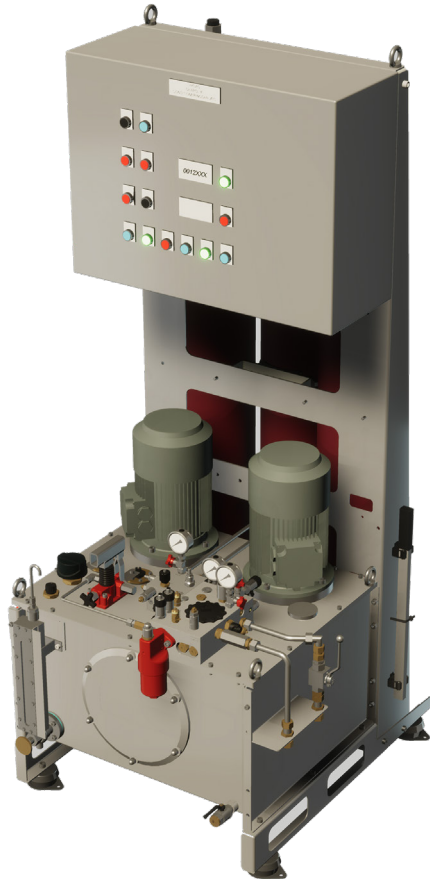


Damcos™ SPU - General

System Power Unit



Advantages

- Major class authority approvals
- Multiple redundancy functions
- Flexible PLC control
- Serviceable and accessible
- Compact and flexible design
- Global ordering and delivery
- Built from standard components
- Meets global requirements
- Automatic control of constant pressure (135 bar)

SPU Description

The SPU has a (100 or 200 L) tank as its basic unit and consists of the following subsystems:

- Internal hydraulic system (before pressure reducing valve)
- External hydraulic system (after pressure reducing valve)
- Two independent electric motor/pump systems
- Alarm system including alarm display for trouble shooting

The Electric control system is started by an operator and the SPU control is activated. The SPU control activates the hydraulic components and pressure is built up in the internal hydraulic system. The SPU control is carried out by 2 PLCs and 2 pressure transmitters.

Before the oil is delivered from the SPU to the solenoid valve cabinets and actuators, the internal pressure is reduced to 135 bar by a pressure reducing valve. The 135 bar in the external hydraulic system ensures a constant operating pressure for the actuators. This constant pressure at the external hydraulic system is referred to as the external or reduced pressure.

If an error occurs, the alarm system is activated as a common alarm or an individual alarm. The operator has to take action before the electric alarm system can be deactivated.

SPU Control types

Two kinds of pressure controls are available for the SPU:

- SPU Automatic (SPU A)
- Full automatic service/standby operation
- Pressure controlled by motor start/stop
- Pressure measured by transmitter
- 135 bar constant output pressure
- SPU Bypass (SPU B)
- Service motor always running
- Pressure controlled by bypass valve open/close
- Pressure measured by transmitter
- 135 bar constant output pressure

Basic Features

SPU A and SPU B both have the following basic features:

Basic features:	Details:
Tank & frame area:	
Tank volume	Project specific
Motor/pump capacity	Project specific
Level switch	2x25%, 2x50% & 2xPT100
Air ventilation	Breather filter
Visual oil level indication	Oil dip stick
Universal block area:	
Universal block	Pressure transmitter & accessory valves
System filtration with pressure & return filter	Visual clogging indication
Pressure relief for internal pressure	Internal system & accumulator(s)
Constant external output pressure	Including external relief function
Accumulator area:	
Accumulator frame	Project specific
Accumulator volume	Project specific
Charging unit	Adaptor for nitrogen filling
Starter box area:	
Starter box: 3xLOGO, 1xPT100 module & el accessories	2 independent control circuits
PLC supply redundancy	Supply failure (alarm activates)
Local operation buttons/lamps (prepared for remote)	START / STOP, RUNNING, POWER ON & common alarm acknowledge button
Common alarm with buzzer, acknowledge & historic	For multiple alarm activation
Standard motor control alarms included in common alarm: M1/M2 circuit failure	Thermal overload, low oil level stop, supply failure & pump failure
Standard state alarms included in common alarm	M1 circuit failure, M2 circuit failure, low oil level alarm, low oil pressure alarm, high oil pressure alarm & high oil temperature alarm
Relay output from PLC	Common alarm remote, common alarm local, buzzer & low oil level alarm

Additional

To meet special customer requirements, the following additional are available:

- Other painting
- Hour counter
- Selector switch
- Main emergency power
- P & T support
- Indication of reduced pressure
- Electric shut down safety
- Accumulator backup functionality
- Vibration dampers
- Motor load indication
- Other additional on request

Classification

Meets the requirements from the major classification and approval authorities like:

- American Bureau of Shipping
- Bureau Veritas
- China Classification Society
- Det Norske Veritas
- Germanischer Lloyd
- Korean Register
- Lloyd’s Register of Shipping
- Nippon Kaiji Kyokai
- Registro Italiano NAVale
- Russian Register of Shipping

Occasional designs can contain special components to meet specific classification authorities.

Specifications

External working pressure	135 bar
Internal working pressure	140/145 - 165 bar
Test pressure (leakage)	270 bar
Recommended ambient temperature	0° C to 45° C
Hydraulic media and viscosity	We recommend acid-free hydraulic mineral oil.
Tank volume	Nominal 100 L or 200 L (total 150 L or 250 L)
Pump capacity at 50/60 Hz	2 x 5.7/6.8 L/min, 2 x 8.6/10.3 L/min or 2 x 12.9/15.5 L/min
Accumulator	Maximum 3 accumulators
Noise level* (front): 1 m from SPU)	Approximately 65 dB(A) - 75 dB(A)
Weight exclusive of accumulator & oil	100 L approx: 425 kg and 200 L approx: 450 kg
T-line	G 1/2" female
P-line	G 1/2" female

*Noise level is only normative and can be exceeded for certain power unit designs and installations.

Standard Setting

Internal pressure relief valve	180 bar
System pressure (pressure reducing valve)	135 bar
Filters (breather, pressure & return)	10 micron
Accumulator precharge pressure (N2)	125 bar
Low oil level alarm	At 50% nominal tank volume (approximately)
Low oil pressure alarm	At 130 bar
High oil pressure alarm	At 170 bar
High oil temperature alarm	At 70° C

Electrical System

Ingress protection	According to local standard (IP 54 on request)
Insulation class	Class F
Main voltage (standard)	380 - 440V AC / 50 - 60 Hz
Pilot voltage (standard)	24 V AC/DC

Materials

Tank, frame:	Structural steel
Universal block:	Cast iron
Fittings:	Cold drawn steel

Painting

Standard coating	China standard: RAL 7035 Korea standard: RAL 7032 or Munsell 7.5 BG 7/2 Denmark standard: RAL 7035 (Other colors on request)
Type	Powder coating by heating
Thickness	between 60 - 70 mm

Standard Models - with the following Model Features:

	MODEL A	MODEL AH	MODEL AE	MODEL AHE	MODEL B
Control Type:					
Automatic motor pump control (SPU A)	X	X	X	X	
Bypass motor pump control (SPU B)					X
Tank & Frame area:					
Oil volume	X	X	X	X	X
Air ventilation by breather filter	X	X	X	X	X
Motor/pump capacity	X	X	X	X	X
Level switch: 2x25%, 2x50% & 2xPT100	X	X	X	X	X
Level switch: 2x25%, 1x50%, 1x95% & 2xPT100			X	X	(X)
Testing device for level switch			X	X	(X)
Visual oil level indication by oil dip stick	X	X	X	X	X
Visual oil level indication by self closing level gauge		X		X	(X)
Other painting	(X)	(X)	(X)	(X)	(X)
Thermometer for visual oil temperature indication		X		X	(X)
Drain valve for tank draining		X		X	(X)
Support for P & T pipes		(X)		(X)	(X)
Hand pump for emergency operation		X		X	(X)
Vibration dampers	(X)	(X)	(X)	(X)	(X)
Universal block area:					
Universal block for SPU A control	X	X	X	X	X
Bypass valve for SPU A => SPU B control					X
System filtrations by pressure filter and return filter	X	X			X
Pressure relief for internal pressure	X	X	X	X	X
Constant external output pressure	X	X	X	X	X
Electric pressure filter clogging alarm			X	X	(X)
Electric return filter clogging alarm			X	X	(X)
Indication of external (reduced) output pressure			(X)	(X)	(X)
External pressure relief		X		X	(X)
Electric shut down safety			(X)	(X)	
Accumulator area:					
Accumulator frame	X	X	X	X	X
1 Accumulator	X	X	X	X	X
2 Accumulators	(X)	(X)	(X)	(X)	(X)
3 Accumulators	(X)	(X)	(X)	(X)	(X)
Accumulator block for 2 or 3 accumulators	(X)	(X)	(X)	(X)	(X)
Accumulator backup function	(X)	(X)	(X)	(X)	(X)
Charging unit	(X)	(X)	(X)	(X)	(X)
Allowable local design modification:					
Different motor size	(X)	(X)	(X)	(X)	(X)
Air ventilation pipe		(X)		(X)	(X)
Manometers with kg/cm2 visualization	(X)	(X)	(X)	(X)	(X)
Stainless steel pipes & fittings	(X)	(X)	(X)	(X)	(X)
External PT100 sensor			(X)	(X)	(X)
20 L accumulator with other approval	(X)	(X)	(X)	(X)	(X)
32 L accumulator with other approval	(X)	(X)	(X)	(X)	(X)

Features marked with X are mandatory for the specific model. Features marked with (X) are available for the specific model.

Standard Models - with the following Model Features:

	MODEL A	MODEL AH	MODEL AE	MODEL AHE	MODEL B
Allowable local design modification:					
50 L accumulator with other approval	(X)	(X)	(X)	(X)	(X)
Nitrogen bottle	(X)	(X)	(X)	(X)	(X)
Starter box area:					
Starter box: 3xLOGO PLC and 1xPT100 module	X	X	X	X	X
Electric parts for SPU A => SPU B					X
Extra I/O module 4 x I/O			X	X	X
Extra I/O module 4 x I/O for high oil level alarm			X	X	(X)
PLC supply redundancy	X	X	X	X	X
START and STOP operation	X	X	X	X	X
Power on and running indication	X	X	X	X	X
Relay output from PLC	X	X	X	X	X
Supply failure (included in motor control)	X	X	X	X	X
Low level stop (included in motor control)	X	X	X	X	X
Thermal overload (included in motor control)	X	X	X	X	X
Pump failure (included in motor control)	X	X	X	X	X
Common alarm with display reset button	X	X	X	X	X
Alarm/buzzer acknowledge button	X	X	X	X	X
M1 circuit failure (included in CA)	X	X	X	X	X
M2 circuit failure (included in CA)	X	X	X	X	X
Low oil pressure alarm (included in CA)	X	X	X	X	X
High oil pressure alarm (included in CA)	X	X	X	X	X
High temperature alarm (included in CA)	X	X	X	X	X
Low oil level alarm (included in CA)	X	X	X	X	X
High oil level alarm (included in CA)			X	X	(X)
Filter clogging alarm (included in CA)			X	X	(X)
Local lamp for low oil level alarm			X	X	(X)
Local lamp for low oil pressure alarm			X	X	(X)
Local lamp for high oil pressure alarm			X	X	(X)
Local lamp for high temperature alarm			X	X	(X)
Local lamp for filter (pressure/return) clogging alarm			X	X	(X)
Local lamp for high level alarm			X	X	(X)
High temperature stop					X
Free relay output					X
Voltmeter			(X)	(X)	(X)
Ammeter			(X)	(X)	(X)
Hour counter			(X)	(X)	(X)
Selector switch for local/remote control			X	X	
Selector switch for service/standby control					X
Main/emergency power			(X)	(X)	(X)
Software:					
	LOGO 1: SPUA M1 SV01		LOGO 1: SPUA M1 SV01		LOGO 1: SPUB M1 SV01
	LOGO 2: SPUA M2 SV01		LOGO 2: SPUA M2 SV01		LOGO 2: SPUB M2 SV01
	LOGO 3: SPUA CA SV01		LOGO 3: SPUA CA SV02		LOGO 3: SPUB CA SV01

Features marked with X are mandatory for the specific model. Features marked with (X) are available for the specific model.

Model Codes

The model codes for the 5 standard models are as follows:

Model **A:**

- Automatic control type
- Minimum standard
- Additional available

Model **AH:**

- Automatic control type
- Minimum standard + extra Hydraulic
- Additional available

Model **AE**

- Automatic control type
- Minimum standard + extra Electric
- Additional available

Model **AHE:**

- Automatic control type
- Minimum standard + extra Hydraulic & Electric
- Additional available

Model **B:**

- Bypass control type
- Minimum standard
- Additional available

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